PB90-153214

Superfund Record of Decision (EPA Region 1): O'Connor Company Site, ME. (First Remedial Action), September 1989

(U.S.) Environmental Protection Agency, Washington, DC

27 Sep 89

U.S. Department of Commerce
National Technical Information Service
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United States
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Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R01-89/038
September 1989

PB90-153214

EPA

Superfund Record of Decision:

O'Connor, ME

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O'Connor, ME
First Remedial Action - Final

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U.S. Environmental Protection Agency
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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The O'Connor site covers a 9-acre area near the city limits of Augusta, Maine. The area neighboring the site consists of woodlands, a small poultry farm, private properties and residences, and wetlands. A portion of the site is also located within a 100-year floodplain. The F. O'Connor Company began operating a salvage and electrical transformer recycling business at the site in the early 1950s. Because of previous oil spills the State investigated the site in 1976 and found the surface water, sediment, and soil contaminated with PCBs. As a result of this study the F. O'Connor Company constructed two surface water impoundments (lagoons) to control further migration of oils from the site. In 1977 the State ordered the F. O'Connor Company to discontinue use of the lagoons. Subsequently the lagoon waters were pumped into several onsite storage tanks and the sediment was excavated, deposited in a low area onsite, and covered with a clay cover. The sediment created a barrier for surface water and formed an upland marsh onsite. In May 1987 EPA and the State jointly issued an amended Administrative Order to F. O'Connor Company requiring field investigations and extensions of the existing fence to areas where additional contamination was found. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are VOCs including benzene, other organics including PCBs and PAHs, and metals including lead. (Continued on next page)

17. Document Analysis a. Descriptors

Record of Decision - O'Connor, ME
First Remedial Action - Final
Contaminated Media: soil, sediment, gw, sw
Key Contaminants: VOCs (benzene), other organics (PCBs, PAHs), metals (lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

19. Security Class (This Report) None

20. Security Class (This Page) None

21. No. of Pages 226

22. Price

(See ANSI-Z39.18)

See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

16. Abstract (Continued)

EPA/ROD/R01-89/038
O'Connor, ME

The selected remedial action for this site includes pumping and offsite treatment of lagoon and upland marsh surface water; excavation and onsite treatment of approximately 23,500 cubic yards of contaminated soil and sediment using a solvent extraction process followed by onsite disposal of residuals; onsite treatment of gases from the solvent extraction process; extraction and offsite treatment of solvent residues using incineration; onsite treatment by solidification of soil and sediment that do not achieve target cleanup goals after treatment, followed by offsite disposal; backfilling and upgrading the excavated area with clean soil and treated soil; ground water pumping and treatment using activated carbon adsorption followed by onsite reinjection; and sediment and ground water monitoring. The estimated total cost for this remedial action is $14,221,000 which includes annual O&M costs of $56,000 in year 1, $54,000 for years 2-4, $92,000 for year 5, and $65,000 for years 6-30.

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ROD DECISION SUMMARY
O'CONNOR CO. SUPERFUND SITE
AUGUSTA, MAINE

SEPTEMBER 27, 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I
BOSTON, MASSACHUSETTS

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

O'Connor Company Site
Augusta, Maine

STATEMENT OF PURPOSE

This decision document presents the selected remedial action for the O'Connor Company site (the "Site"), located in Augusta, Maine. This decision was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the National Contingency Plan (NCP); 40 CFR Part 300 *et seq.* (1985). The Regional Administrator has been delegated the authority to approve this Record of Decision.

The State of Maine has concurred on the selected remedy and determined, through a detailed evaluation, that the selected remedy is consistent with Maine laws and regulations.

STATEMENT OF BASIS

This decision is based on the administrative record compiled for the Site which was developed in accordance with Section 113(k) of CERCLA. The administrative record is available for public review at the Lithgow Public Library in Augusta, Maine, and at the EPA Region I Waste Management Division Record Center in Boston, Massachusetts. The administrative record index (attached as Appendix E to the ROD) identifies each of the items which comprise the administrative record upon which the selection of the remedial action is based.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for the Site is a comprehensive approach for complete remediation of the principal threats posed by the Site. This approach includes both source control and management of migration components, as described below:

Source Control Components:

EPA will initiate remediation at the Site by pumping the contaminated surface water from the upper and lower lagoons and the upland marsh. This water will be transported via tanker trucks to a permitted, off-site treatment facility. At this time, the volume of water to be pumped is estimated at between 150,000 and 195,000 gallons (total).

EPA will then treat all of the approximately 23,500 cubic yards of contaminated soils and sediments containing PCBs, cPAHs, and lead above the established target cleanup goals using a solvent extraction technology. This technology principally involves the use of a solvent to extract the PCBs and cPAHs from the contaminated soils and sediments. The lead is not likely to be treated by this technology to any significant degree. However, since the lead-contaminated materials are co-located with the PCBs and cPAHs, it would be technically impracticable to separate out the lead; additionally, the treatability study results indicate that the lead may in fact bind to the treatment residue resulting from solvent extraction. The contaminated liquid containing the extracted PCBs and cPAHs will be destroyed at a licensed, off-site TSCA incinerator. During on-site solvent extraction, exhaust gases from the process will be treated by air pollution control devices to ensure that appropriate health and safety and air quality requirements are being met.

Prior to full-scale implementation of the solvent extraction process on the Site, additional treatability studies will be performed both in the laboratory and at the Site. These additional studies will provide further information regarding the ability of this technology to achieve the 1 ppm cleanup goals for PCBs and cPAHs that have been established for the Site, and will also assist in establishing the optimum operational settings for full-scale extraction of these contaminants at the Site.

Additionally, soil and sediment treatment residues resulting from the solvent extraction process that have lead levels above the 248 ppm target cleanup level, will undergo further treatment using a solidification/stabilization technology if, after undergoing the EPA standard EP (extraction procedure) toxicity test or TCLP (toxicity characteristic leaching procedure), they continue to exhibit the characteristics of a hazardous waste. The solidification/stabilization treatment technology essentially uses a combination of processes to bind contaminants within the treated mass, resulting in a substantial reduction in the mobility of the contaminants.

Those solid treatment residues resulting from the solvent extraction process that do not achieve the target cleanup goals established for the protection of human health and the environment at the Site (i.e., 1 ppm PCBs, 1 ppm cPAHs, or 248 ppm lead) and/or that have undergone additional treatment through solidification/stabilization, will be transported off-site in appropriately sized containers and trucks to be disposed of at a licensed landfill. It is currently approximated by EPA that 5,000 cubic yards of the total 23,500 cubic yards of contaminated soils and sediments undergoing solvent extraction will require off-site disposal.

Following implementation of the above-described remedial action source control components, the Site will be restored. This will include the backfilling of those areas of the Site where excavation occurred. The backfilling of these areas will require that: (a) new native soil be brought to the Site from an off-site location (approximately 5,000 cubic yards), and (b) those residual soils from the on-site solvent extraction system that achieve all the established target cleanup goals be placed back onto the Site (approximately 18,500 cubic yards). These backfilled soils will then be regraded to establish new surface water drainage patterns on the Site.

In addition, the drainage and off-site treatment of those contaminated surface waters contained within the upland marsh, and upper and lower lagoons on the Site require that these waters of the U.S./wetlands be compensated for due to unavoidable impacts that may be caused by the destruction of these areas. Therefore, compensatory wetlands will be established within the F. O'Connor property following the completion of the source control components of the selected remedy. Furthermore, any potential effects on the 100-year floodplain partially located on the Site will be limited through the use of careful construction practices during the entire excavation activity to be performed at the Site.

Management of Migration Components:

EPA will actively address groundwater contamination at the Site by utilizing collection and carbon adsorption treatment techniques. The system will first entail the installation of one or more groundwater extraction wells on the Site. Collected groundwater will then be pumped through a granular filter to remove particulates, suspended solids, and oil droplets. Following this preliminary filtration step, the groundwater will be treated by carbon adsorption, which uses activated carbon to remove the organic contaminants found in the groundwater.

Prior to full-scale implementation of the groundwater collection and treatment system, the exact location, number of extraction well(s), operating conditions, capture zone efficiency, etc. will be determined during the design phase of the selected remedy. This will include the performance of one or more pump tests at the Site. If, based on these pump test(s) and the analytical results of the groundwater from these tests, inorganics such as iron and/or manganese are present and could cause fouling problems with the activated carbon unit, then an in-line pretreatment unit for these metals would be added during the design phase of the overall treatment system.

The treated water that achieves the target cleanup goals established for the Site will be recharged back into the ground on the Site. System monitoring, in the form of periodic sampling and analysis, will occur at the Site to evaluate the performance and efficiency of the entire groundwater extraction system.

Additionally, EPA will recommend the temporary establishment of institutional controls on the Site groundwater. These recommended controls will involve deed and land-use restrictions to restrict the use of groundwater on the Site during overall site remediation.

In addition to the groundwater treatment system, environmental sampling of the sediments within Riggs Brook and its associated nearby wetlands will be conducted once every year for ten years. This will be combined with the establishment of public education programs designed to increase public awareness about the status of contamination within Riggs Brook.

DECLARATION

The selected remedy is protective of human health and the environment, attains all Federal and State requirements that are applicable or relevant and appropriate (ARAR) to this remedial action, and is cost-effective. This remedy satisfies the statutory preference for remedies that employ treatment and that reduce the toxicity, mobility or volume as a principal element and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

Additionally, because the remedy will result in hazardous substances remaining in the groundwater and sediments on the Site above health based levels, a review will be conducted (at a minimum) within five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Sept 27, 1989
Date

Paul G Keough
Acting Regional Administrator
U.S. EPA, Region I

O'CONNOR CO. SITE
Record of Decision Summary

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O'CONNOR CO. SITE
Record of Decision Summary

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I. SITE NAME: O'Connor Co.
LOCATION: Augusta, Maine
DESCRIPTION:

The O'Connor Co. site ("the Site") is located along U.S. Route 17 near the eastern boundary of the city limits of Augusta, Maine (see Figure 1-1). The Site consists of approximately nine acres of land located within a larger 65-acre expanse of property. The Site is currently surrounded by a chain link fence, and is bordered by woodlands and a small poultry farm to the north, U.S. Route 17 to the south, private properties and residences to the west, and the west branch of Riggs Brook and its associated wetlands to the east.

Principal features of the Site include a large barn that formerly housed scrap operations, an upland marsh, a "low area", two surface water impoundments (lagoons), three former transformer work areas (TWAs), and a former scrap area (see Figure 1-2).

A more complete description of the Site can be found in the Remedial Investigation (RI) report, dated June 1989, at pages 1-3, and 2-1 to 2-2.

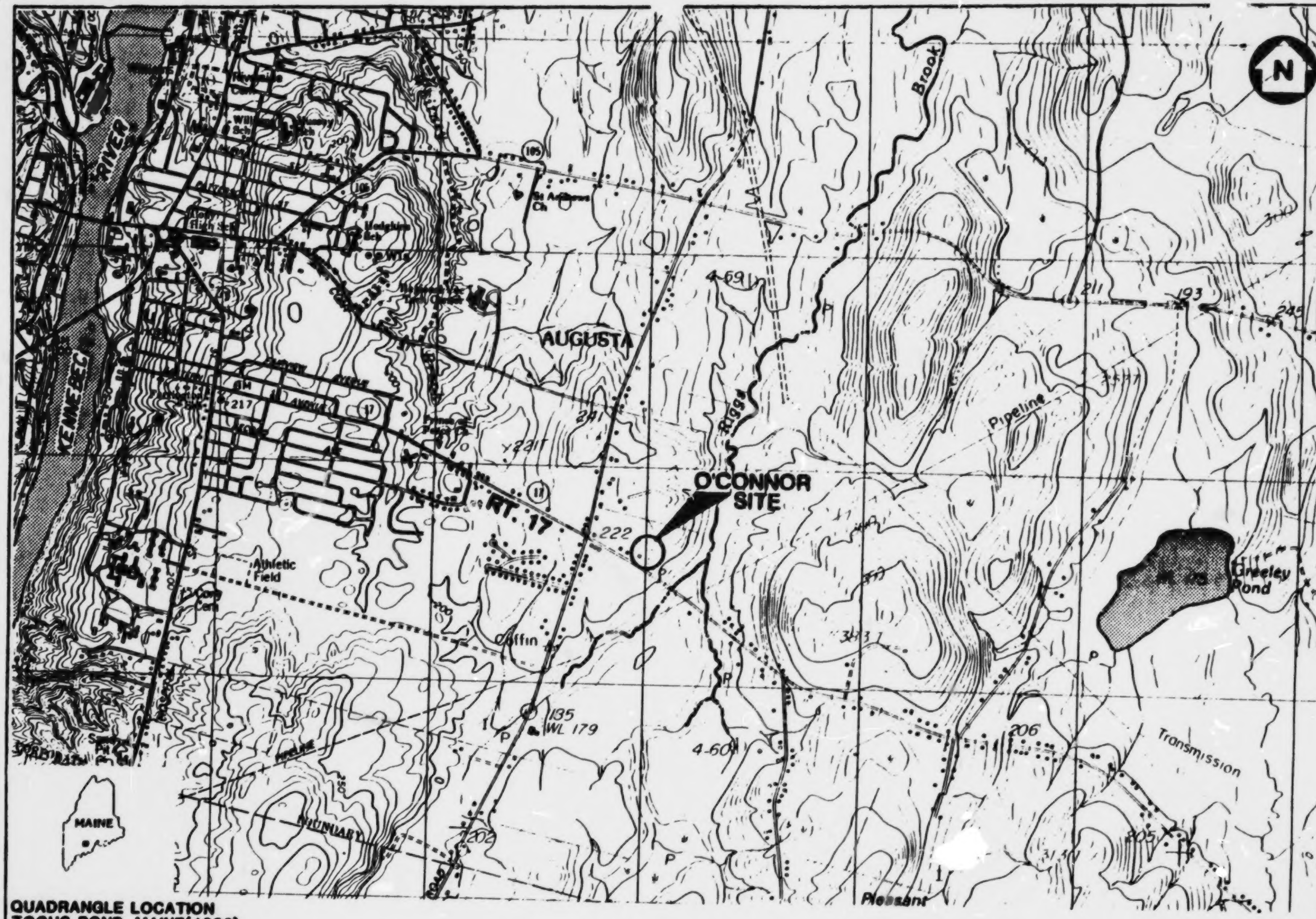
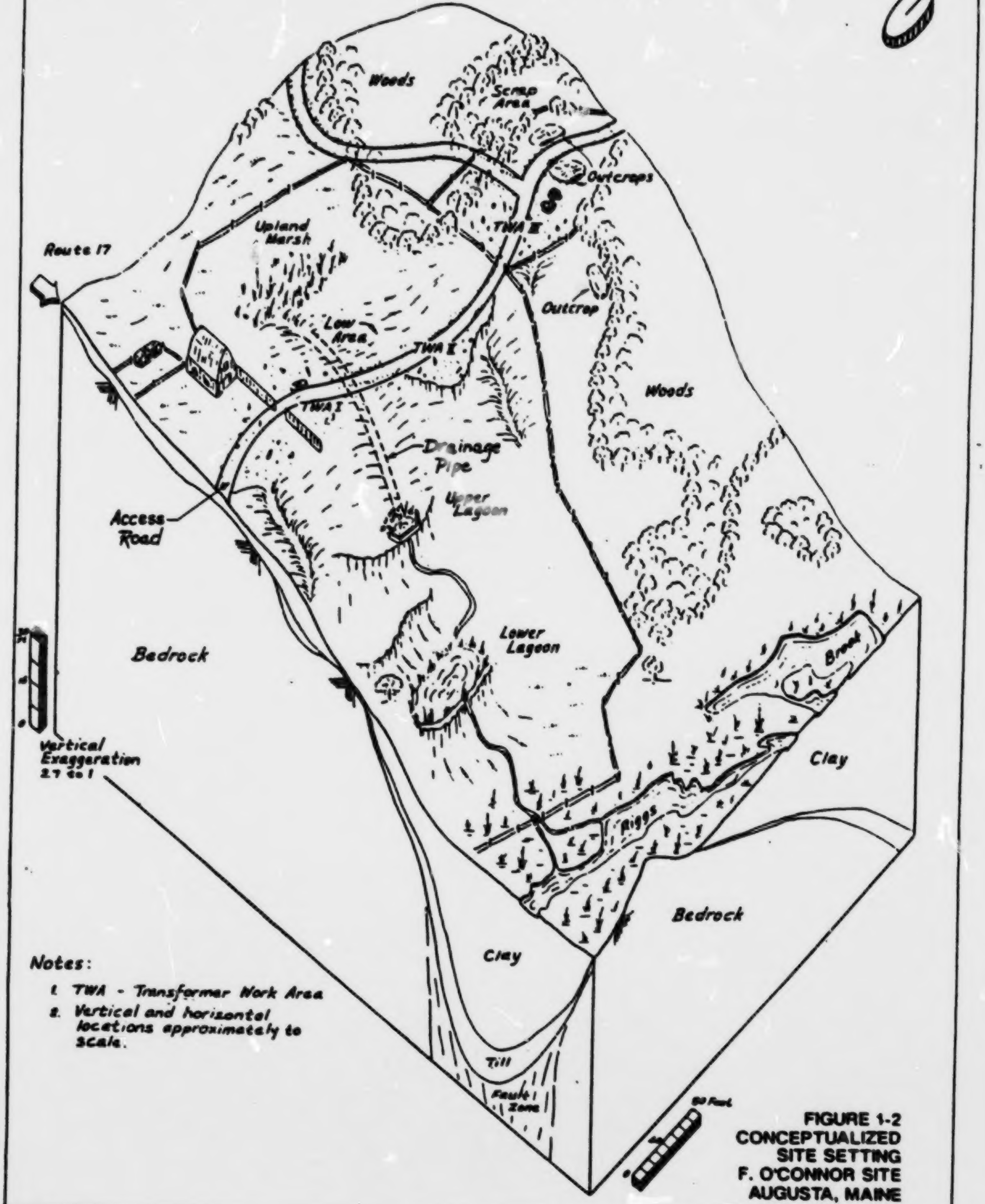

N
KENNEBEC
RIVER
AUGUSTA
RT. 17
O'CONNOR SITE
222
241
4-691
Riggs
Brook
Pipeline
Athletic Field
Coffin
135
WL 179
4-601
206
Transmission
Greeley Pond
211
193
Pleasant
MAINE
BOUNDARY
QUADRANGLE LOCATION
TOGUS POND, MAINE(1982)
N4415-W6927-30/7.5
0
2000
4000 FEET

FIGURE 1-1
SITE LOCATION MAP
O'CONNOR SITE

E.C.JORDAN CO. -

Reproduced from best available copy.

4903-23


Woods
Scrap Area
Outcrops
Upland Marsh
TWA II
Route 17
Outcrop
Low Area
TWA II
TWA I
Woods
Drainage Pipe
Upper Lagoon
Access Road
Lower Lagoon
Bedrock
Brook
Vertical Exaggeration 2.7 to 1
Clay
Riggs
Bedrock
Clay
Till
Fault Zone
50 Feet
0

Notes:

1. TWA - Transformer Work Area
2. Vertical and horizontal locations approximately to scale.

FIGURE 1-2
CONCEPTUALIZED
SITE SETTING
F. O'CONNOR SITE
AUGUSTA, MAINE

[illegible]-24

ECJORDANCO

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Response History

The F. O'Connor Co. began operating a salvage and electrical transformer recycling business at the Site in the early 1950's. Operations included stripping and recycling transformers containing PCB-laden oils which were generated by Central Maine Power (CMP). In February 1972, an oil spill at the Site was found to have migrated towards Riggs Brook. Later that same year, at the request of the Maine Department of Environmental Protection (DEP), the F. O'Connor Co. began containing all transformer fluids found on the Site in an aboveground storage tank to prevent future spills.

In 1976, the Maine DEP began further investigations at the Site through the sampling and analysis of soils, sediments, and surface waters for PCBs. As a result of these activities, the Maine DEP requested the F. O'Connor Co. to construct two surface water impoundments (lagoons) to control further migration of oils from the Site. The F. O'Connor Co. did so.

In 1977, also at the request of the Maine DEP, the F. O'Connor Co. discontinued use of the lagoons in order to reclaim these areas. More specifically, the lagoon waters were pumped into several on-site storage tanks, and the lagoon sediments were excavated and deposited into a "low area" on the Site. These excavated sediments were underlain and also covered by approximately one foot of clay soil. Deposition of these sediments created a barrier for natural surface water drainage from the Site to Riggs Brook. This resulted in the formation of the upland marsh which is located behind the on-site barn structure.

Four sampling events by the United States Environmental Protection Agency (EPA) from 1982 to 1984, and additional Maine DEP sampling efforts in 1978 and 1982, confirmed the presence of significant PCB contamination at the Site. In December 1982, the Site was proposed for inclusion on EPA's National Priorities List (NPL), and was placed on the final NPL on September 8, 1983.

A more detailed description of the Site history can be found in the RI report at pages 1-6 to 1-8, and related appendices to this report.

B. Enforcement History

On December 21, 1984, EPA issued a Unilateral Administrative Order to the F. O'Connor Co. requiring it to construct a fence around and post warning signs along approximately five acres of the Site, as defined at that time. This Order, which was complied with by the F. O'Connor Co., further required sampling and analysis of the contents of all drums and storage tanks found at the Site.

In April of 1985, EPA notified CMP and the F. O'Connor Co. of their potential liability with respect to the Site on grounds that they either owned or operated the facility, generated hazardous substances that were shipped to the facility, arranged for the disposal of hazardous substances at the facility, or transported hazardous substances to the facility. Subsequently, negotiations commenced with these potentially responsible parties (PRPs) regarding settlement of the PRPs' liability at the Site.

On May 13, 1986, EPA issued an Administrative Order by Consent (AOC) to the F. O'Connor Co. and CMP. This Order was entered into voluntarily by these parties in order to conduct a Remedial Investigation/Feasibility Study (RI/FS) to determine the nature and extent of contamination, and to evaluate alternatives and recommendations for the appropriate extent of remedial actions at the Site. On May 19, 1986, the Maine DEP also issued an Administrative Order to the F. O'Connor Co. designating the Site as an Uncontrolled Hazardous Substance Site under Maine law.

On June 23, 1986, the Maine DEP issued an AOC to the F. O'Connor Co. and CMP by which these parties agreed to remove the currently known threat to the public health or welfare or the environment which was posed by the hazardous substances present in tanks and containers remaining at the Site, and to conduct and prepare an RI/FS for the Site.

On May 23, 1987, EPA and the Maine DEP jointly issued an Amended AOC to the F. O'Connor Co. and CMP modifying EPA's original May 13, 1986 AOC, and superseding those portions of the previous AOC issued by the Maine DEP which ordered these same parties to conduct an RI/FS at the Site. Additionally, this Amended AOC required the PRPs to conduct additional field investigations and extend the then-existing five-acre fence to areas where additional contamination was found. In compliance with this Amended AOC, the PRPs performed the required sampling which resulted in the installation of additional fences and warning signs to secure the present nine-acres of the Site.

To date, CMP has been actively involved in the development and preparation of the RI/FS and remedy selection process for the Site. A significant amount of correspondence has occurred between EPA, the Maine DEP and the PRPs throughout this process, as documented in the Administrative Record prepared for the Site. This correspondence includes technical comments submitted by the PRPs during the public comment period for the Proposed Plan. Those comments received during the public comment period and EPA's responses to these comments are included in the Responsiveness Summary attached to this Record of Decision (ROD) as Appendix A. To date, special notice has not been issued in this case.

III. COMMUNITY RELATIONS

Throughout the Site's history, community involvement has been low to moderate. EPA has kept the community and other interested parties apprised of the Site activities through informational meetings, fact sheets, press releases and public meetings.

In September 1985, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed about and involved in the remedial activities to be conducted at the Site.

On June 11, 1986, EPA held an informational meeting in the Civic Room of the Augusta City Hall to describe the plans for the Remedial Investigation and Feasibility Study (RI/FS).

On July 13, 1989, EPA made the Administrative Record available for public review at EPA's offices in Boston and at the Lithgow Public Library in Augusta. EPA published a notice and brief analysis of the Proposed Plan for the Site in the Kennebec Journal on July 12, 1989 and made the plan available to the public through individual mailings and at the Lithgow Public Library.

On July 19, 1989, EPA held a public informational meeting to discuss the results of the Remedial Investigation and the cleanup alternatives presented in the Feasibility Study (dated June 1989), and to present the Agency's Proposed Plan. Also during this meeting, representatives from EPA and the Maine DEP answered questions from the public about the Site and the remedial alternatives under consideration. From July 20, 1989 to August 19, 1989, the Agency held a 30-day public comment period to accept public comments on the alternatives presented in the Feasibility Study and the Proposed Plan, and on the other documents which were a part of the Administrative Record for the Site. On August 10, 1989, the Agency held a public hearing to accept any oral comments about the Site. A transcript of this hearing, and the Agency's response to comments made during the public comment period are included in the Responsiveness Summary that is attached as Appendix A hereto.

IV. SCOPE AND ROLE OF RESPONSE ACTION

The selected remedy was developed by combining source control and management of migration remedial alternatives to obtain a comprehensive approach for overall Site remediation. In summary, the response action contained in this ROD addresses the principal threats to human health and environment posed by the Site through treatment of the contaminated soils, sediments, surface waters, and groundwater found on the Site.

Additionally, this response action is consistent with all previous removal actions which have contributed to the efficient performance of this final, planned response action. At the present time, no further operable units are expected to be performed at the Site in the future.

V. SITE CHARACTERISTICS

Chapter 1.0, subsection 1.2 of the Feasibility Study (FS) report contains an overview of the Remedial Investigation (RI) performed at the Site. The significant findings of the RI are summarized below.

A. Soil

During the RI, approximately 500 soil samples were taken from the Site surface (through grid or grab samples) and subsurface (through shallow borings or test pits). These samples revealed the presence of a wide range of organic and inorganic chemicals of concern. More specifically, polychlorinated biphenyls (PCBs) and lead were the principal substances found in the surface (0 to 6-inch deep) soils; whereas, PCBs and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were the principal contaminants detected in the subsurface (0.5 to 12-feet deep) soils.

The largest areas of PCB-contaminated soils were found primarily within the former transformer work areas (TWAs), and the drainage areas associated with these TWAs. Small, discrete areas of highly contaminated PCB soils were found in the TWA III/scrap area (see Figure 1-3). These contaminated soils were discovered beneath former electrical equipment, and found to contain up to 200,000 parts per million (ppm) PCBs. Lead was detected above background (i.e., approximately 70 ppm-average) principally in the surface soils within TWAs I and II, with the maximum lead concentration occurring at 4,100 ppm within TWA II.

Subsurface soils taken from TWAs I and II, and the "low area" contained cPAHs. The depth of vertical migration of the cPAHs appeared to be limited to the upper 6-feet within TWA I and the low area, while a small pocket of cPAHs was found to exceed 8-feet deep within TWA II. The maximum cPAH concentration of 30 ppm was found within the low area. PCBs in the subsurface soils were, on average, limited to 2-feet or less in depth, while the areas of maximum vertical migration occurred within TWAs I and II at depths of up to 10 to 12-feet.

The reader is referred to Figures 4-8, 1-6, 4-10, and 1-10 for an overview of the distribution of the PCB-, cPAH-, and lead-contaminated soils found at the Site. Additionally, a more complete description of the soil contamination and information regarding the geologic characteristics of the Site can be found in Chapter 4.0 of the Remedial Investigation (RI) report.

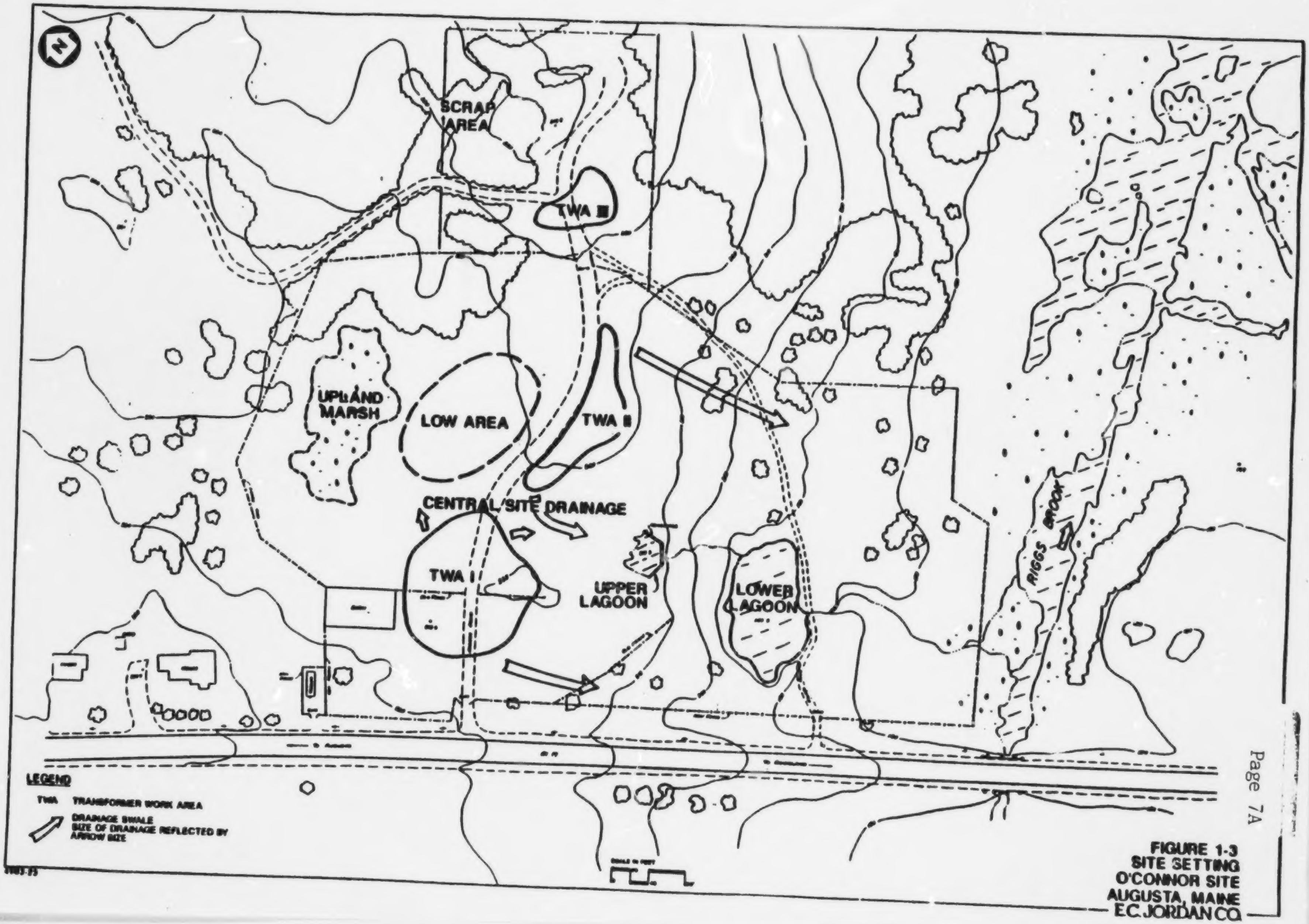
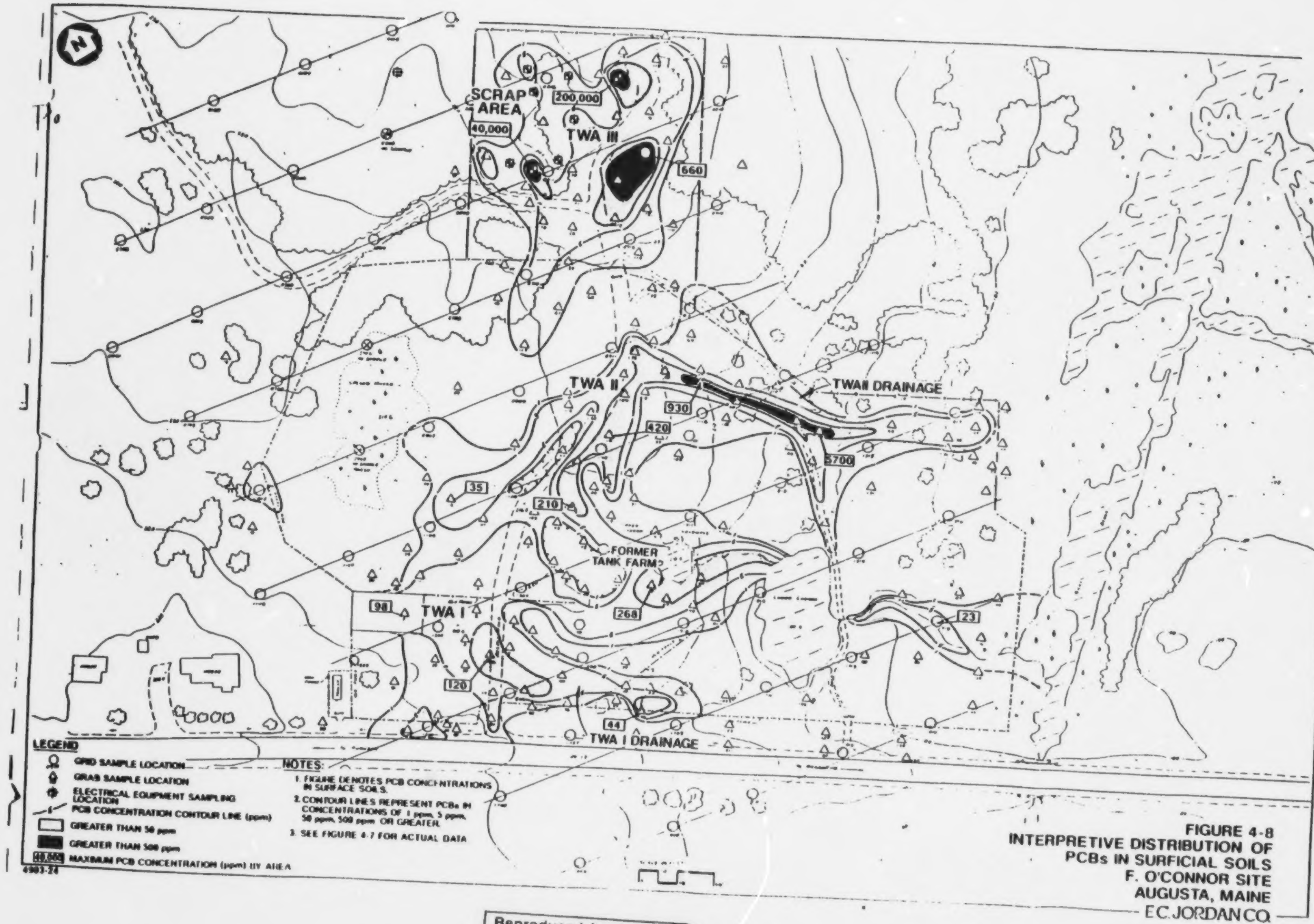

SCRAP AREA
TWA III
UPLAND MARSH
LOW AREA
TWA II
CENTRAL SITE DRAINAGE
TWA I
UPPER LAGOON
LOWER LAGOON
RIGGS BROOK
LEGEND
TWA TRANSFORMER WORK AREA
DRAINAGE SWALE
SIZE OF DRAINAGE REFLECTED BY ARROW SIZE
SCALE IN FEET

FIGURE 1-3
SITE SETTING
O'CONNOR SITE
AUGUSTA, MAINE
E.C. JORDAN CO.


SCRAP AREA
40,000
200,000
TWA III
660
TWA II
TWA II DRAINAGE
930
420
5700
35
210
FORMER TANK FARM?
268
23
98
TWA I
120
44
TWA I DRAINAGE
LEGEND
GRID SAMPLE LOCATION
GRAB SAMPLE LOCATION
ELECTRICAL EQUIPMENT SAMPLING LOCATION
PCB CONCENTRATION CONTOUR LINE (ppm)
GREATER THAN 50 ppm
GREATER THAN 500 ppm
40,000 MAXIMUM PCB CONCENTRATION (ppm) BY AREA
4903-24

NOTES:

1. FIGURE DENOTES PCB CONCENTRATIONS IN SURFACE SOILS.
2. CONTOUR LINES REPRESENT PCBs IN CONCENTRATIONS OF 1 ppm, 5 ppm, 50 ppm, 500 ppm OR GREATER.
3. SEE FIGURE 4-7 FOR ACTUAL DATA

FIGURE 4-8
INTERPRETIVE DISTRIBUTION OF
PCBs IN SURFICIAL SOILS
F. O'CONNOR SITE
AUGUSTA, MAINE
E.C. JORDAN CO.

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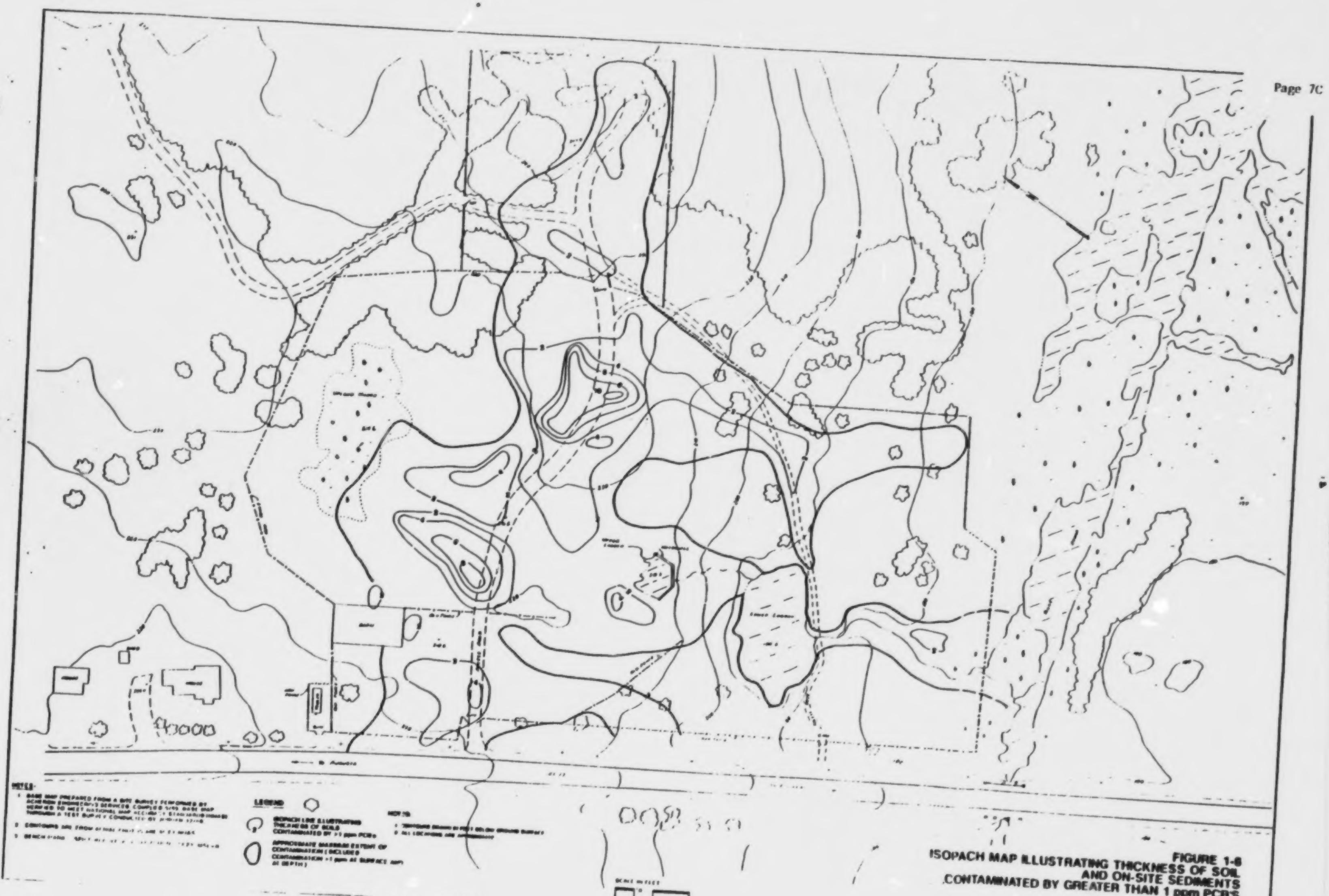
LEGEND
ISOPACH LINE ILLUSTRATING THICKNESS OF SOILS CONTAMINATED BY >1 ppm PCBs
APPROXIMATE MAXIMUM EXTENT OF CONTAMINATION (INCLUDES CONTAMINATION >1 ppm AT SURFACE AND AT DEPTH)
NOTES
SCALE IN FEET

FIGURE 1-8
ISOPACH MAP ILLUSTRATING THICKNESS OF SOIL AND ON-SITE SEDIMENTS CONTAMINATED BY GREATER THAN 1 ppm PCB'S
O'CONNOR SITE
AUGUSTA, MAINE

E.C. JORDAN CO.

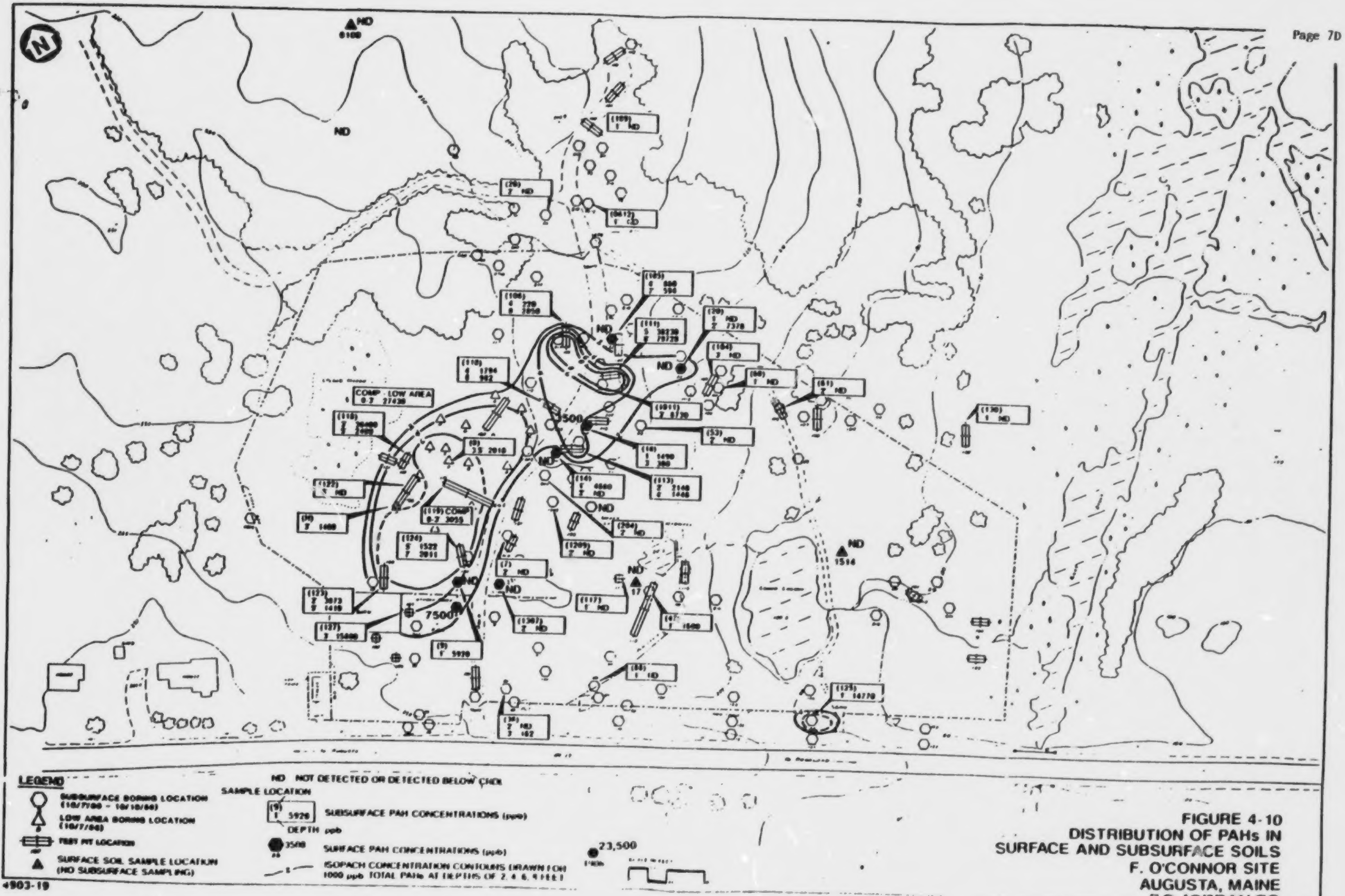
LEGEND
SUBSURFACE BORING LOCATION (10/7/80 – 10/10/80)
LOW AREA BORING LOCATION (10/7/80)
TEST PIT LOCATION
SURFACE SOIL SAMPLE LOCATION (NO SUBSURFACE SAMPLING)
ND NOT DETECTED OR DETECTED BELOW CHDL
SAMPLE LOCATION
(9) 1 5920
SUBSURFACE PAH CONCENTRATIONS (ppb)
DEPTH ppb
3500
SURFACE PAH CONCENTRATIONS (ppb)
ISOPACH CONCENTRATION CONTOURS DRAWN FOR 1000 ppb TOTAL PAHs AT DEPTHS OF 2, 4, 6, 9 FEET
23,500
7500
3500
ND
COMP - LOW AREA 0.2 27430
4903-19

FIGURE 4-10
DISTRIBUTION OF PAHs IN
SURFACE AND SUBSURFACE SOILS
F. O'CONNOR SITE
AUGUSTA, MAINE
E.C. JORDAN CO.

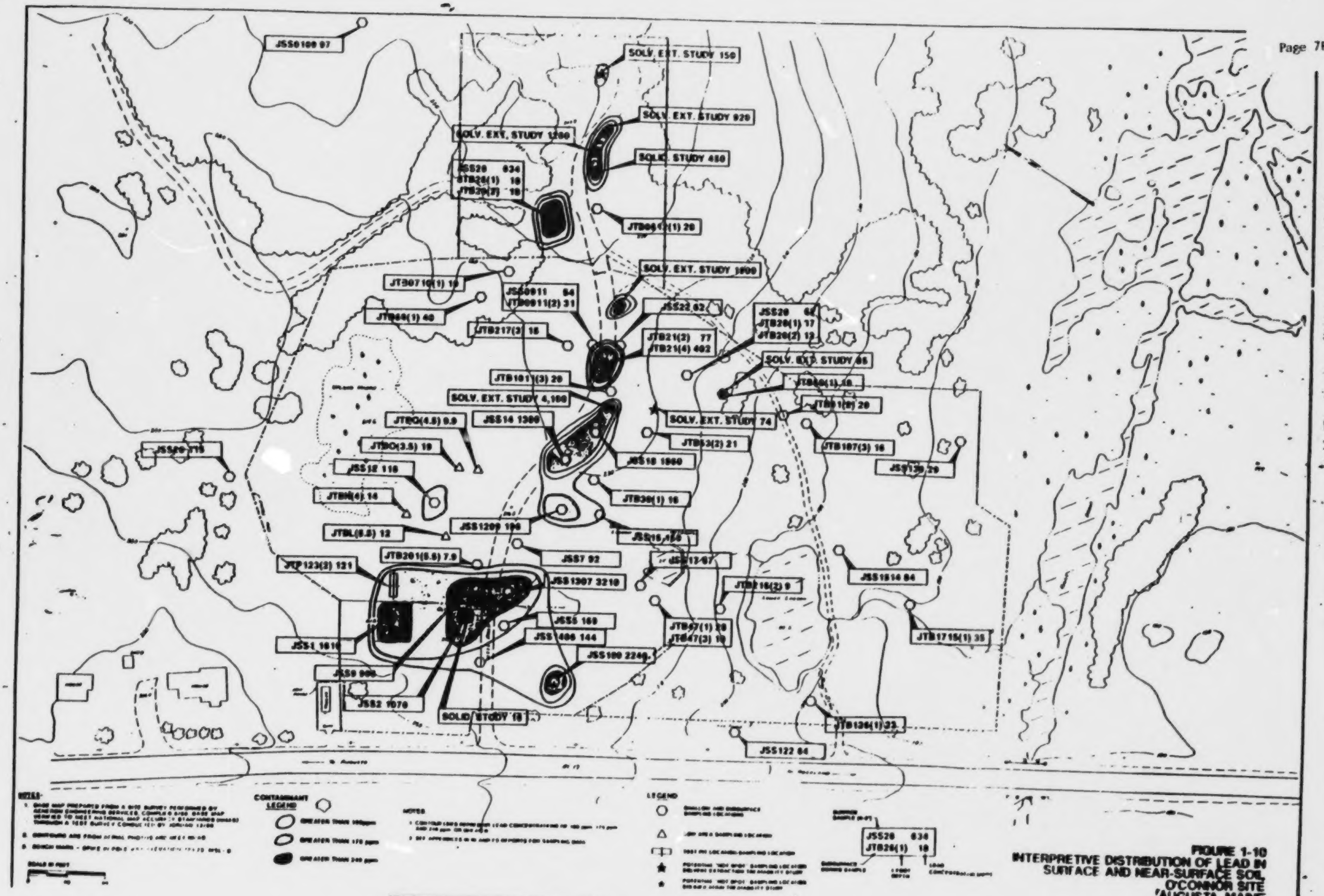
JSS0100 97
SOLV. EXT. STUDY 150
SOLV. EXT. STUDY 920
SOLV. EXT. STUDY 1200
SOLID. STUDY 450
JSS20 634
JTB20(1) 18
JTB20(2) 18
JTB0612(1) 20
SOLV. EXT. STUDY 1800
JTB0710(1) 19
JSS0911 54
JTB0911(2) 31
JTB60(1) 40
JSS22 62
JTB217(2) 16
JTB21(2) 77
JTB21(4) 402
JSS20 64
JTB20(1) 17
JTB20(2) 12
SOLV. EXT. STUDY 85
JTB1011(3) 20
SOLV. EXT. STUDY 4,100
JSS14 1300
SOLV. EXT. STUDY 74
JTB53(2) 21
JTB107(3) 16
JSS130 29
JTBO(4.5) 9.9
JTBO(3.5) 19
JSS20 115
JSS12 116
JSS18 1980
JTBH(4) 14
JTB30(1) 16
JSS1209 186
JTBL(5.5) 12
JSS16 150
JTB201(5.5) 7.9
JSS7 92
JSS17 67
JTP123(2) 121
JSS1307 3210
JTB216(2) 9
JSS1514 84
JSS5 160
JSS1406 144
JTB47(1) 28
JTB47(3) 10
JTB1715(1) 35
JSS1 1610
JSS100 2240
JSS9 900
JSS2 1070
SOLID STUDY 18
JTB136(1) 23
JSS122 84
NOTES:
SCALE IN FEET
CONTAMINANT LEGEND
GREATER THAN 100ppm
GREATER THAN 175 ppm
GREATER THAN 240 ppm
NOTES
LEGEND
JSS20 634
JTB20(1) 18
E.C. JORDAN CO.

FIGURE 1-10
INTERPRETIVE DISTRIBUTION OF LEAD IN SURFACE AND NEAR-SURFACE SOIL
O'CONNOR SITE
AUGUSTA, MAINE

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B. Groundwater

During the RI field work, a total of five (5) nested pairs of groundwater monitoring wells and one single monitoring well were installed at the Site (see Figure 5-1). Each nested pair of wells was screened within the overburden, but below the water table, and within the bedrock. The single monitoring well was screened within the bedrock only, due to the limited overburden thickness at this location. These wells were installed at locations specifically chosen to monitor conditions upgradient (background) conditions and downgradient from the major contaminated source areas (especially, TWAs I and II)as well as within major drainage pathways/discharge zones to Riggs Brook.

Based upon the hydrogeologic information obtained from the above-mentioned monitoring wells, two distinct groundwater flow systems were identified at the Site: a shallow, unconfined overburden system; and a deep/bedrock system. The deep/bedrock system was determined to be unconfined beneath higher (elevated) portions of the Site and confined under the lower portions near Riggs Brook. The confining unit for the deep/bedrock flow system was determined to begin just west of the lower lagoon and is composed of marine clay averaging 10 to 15 feet thick (see Figure 1-4).

Groundwater in the deep/bedrock system under the Site was determined to flow in a west-to-east direction, primarily through the vertical fractures in the bedrock which were found to trend in an east-west direction. Groundwater flow in the shallow system was generally from the northeast to southwest within the sands and till materials at the Site. Both groundwater flow systems are recharged from precipitation falling onto higher elevations of the Site, and discharge towards Riggs Brook.

Three (3) rounds of groundwater samples were taken from the above-mentioned monitoring wells during the RI field work. All monitoring wells during all rounds of sampling were analyzed for PCBs (either filtered and/or unfiltered), while organic and inorganic samples were obtained from selected wells based upon previous rounds of analytical data.

The results from these sampling events indicate that chlorinated benzene compounds (i.e., chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene) were consistently detected in the bedrock well located downgradient of TWA II (well MW-104B), and to a lesser extent in the shallow and bedrock wells downgradient of TWAs I and III. The maximum concentrations of these compounds were as follows: 1,2,4-trichlorobenzene (310 parts per billion-ppb); 1,4-dichlorobenzene (28 ppb); 1,2-dichlorobenzene (17 ppb); and chlorobenzene (16 ppb).

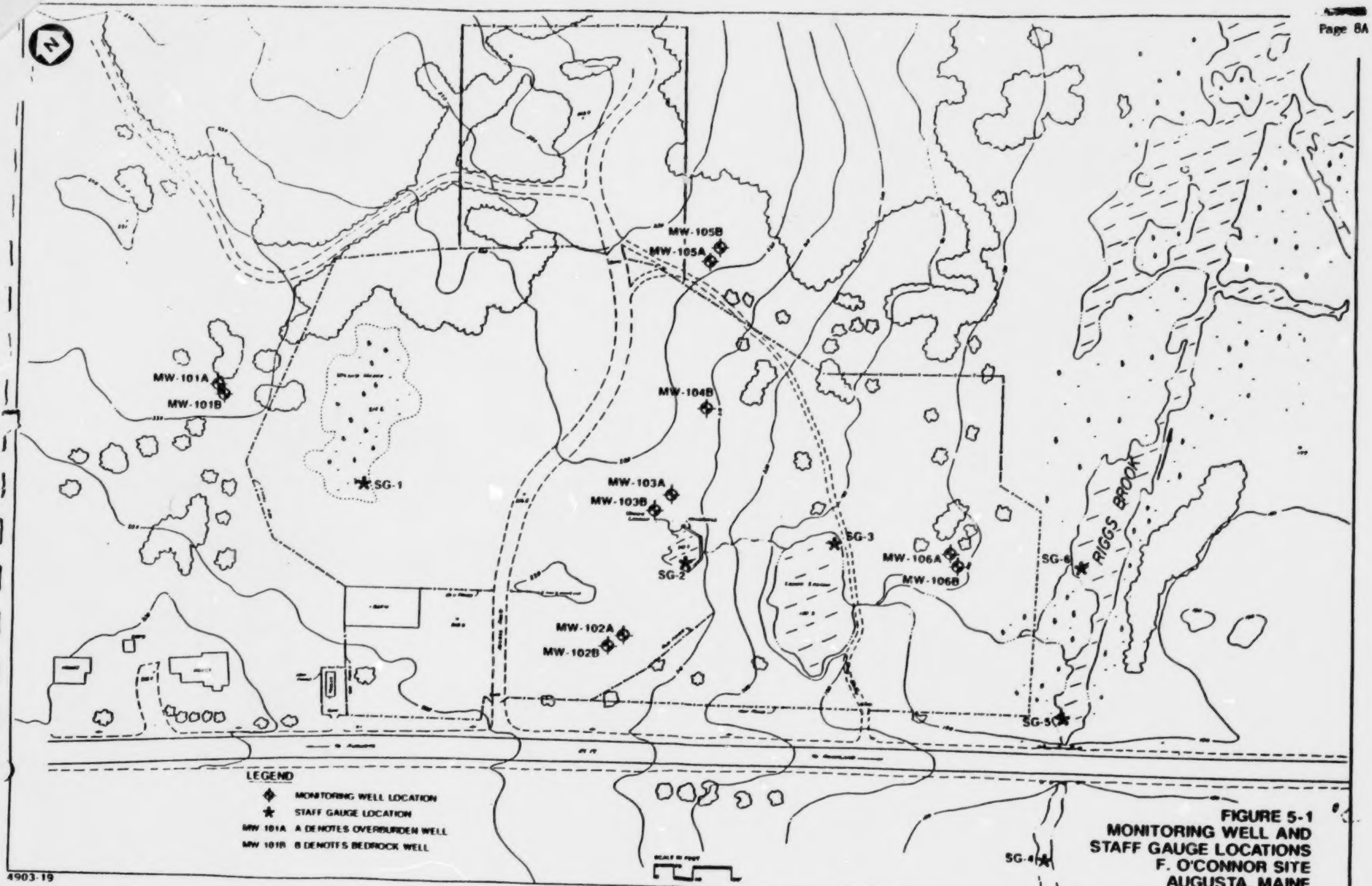
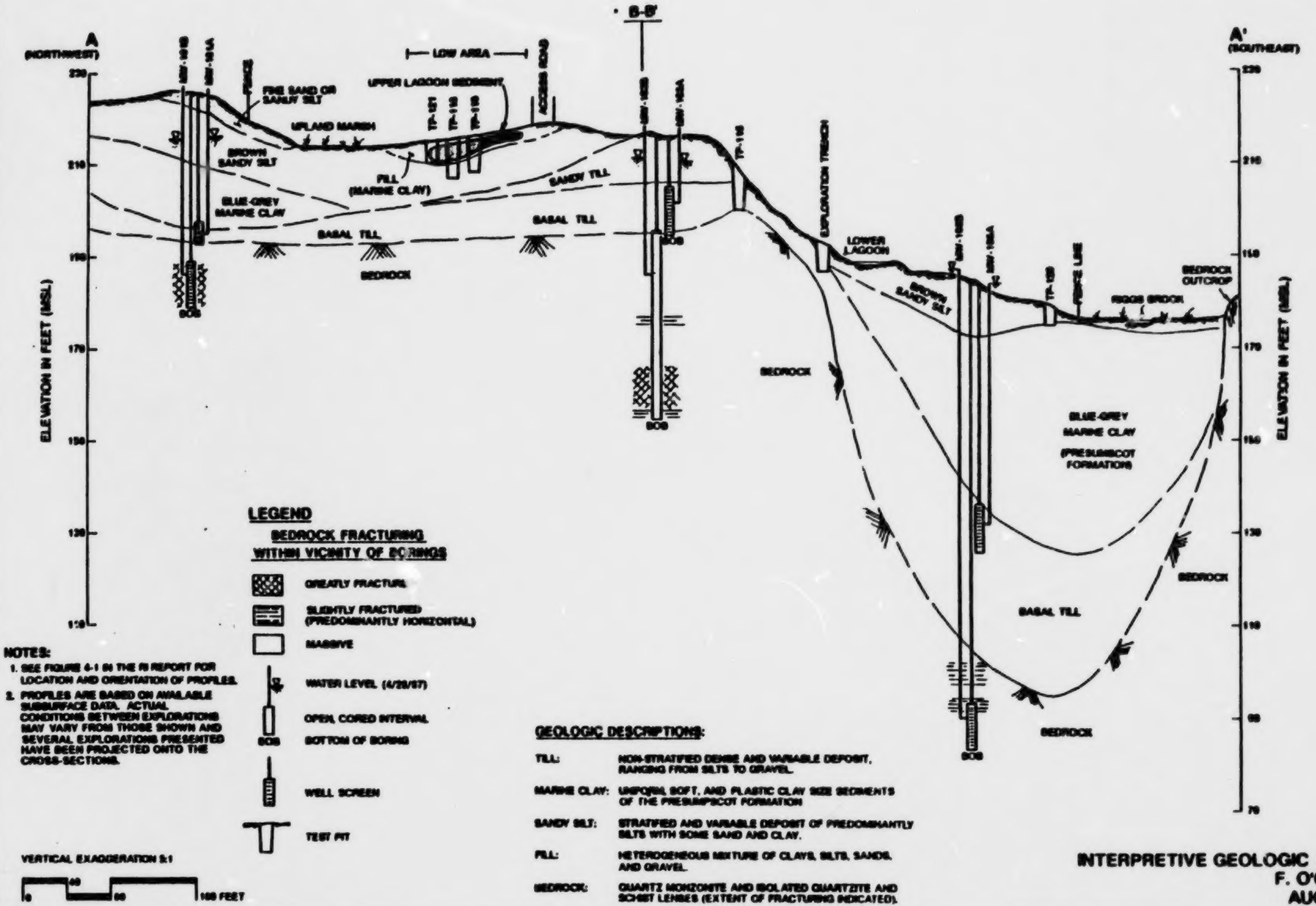

MW-101A
MW-101B
SG-1
MW-105B
MW-105A
MW-104B
MW-103A
MW-103B
SG-2
MW-102A
MW-102B
SG-3
MW-106A
MW-106B
SG-6
RIGGS BROOK
SG-5
SG-4
LEGEND
MONITORING WELL LOCATION
STAFF GAUGE LOCATION
MW 101A A DENOTES OVERBURDEN WELL
MW 101B B DENOTES BEDROCK WELL
4903-19

FIGURE 5-1
MONITORING WELL AND
STAFF GAUGE LOCATIONS
F. O'CONNOR SITE
AUGUSTA, MAINE
E.C.JORDAN CO.


A
(NORTHWEST)
A'
(SOUTHEAST)
B-B'
ELEVATION IN FEET (MSL)
230
210
190
170
150
130
110
90
70
MW-101B
MW-101A
FENCE
FINE SAND OR SANDY SILT
UPLAND MARSH
LOW AREA
UPPER LAGOON SEDIMENT
TP-121
TP-118
TP-119
ACCESS ROAD
BROWN SANDY SILT
FILL (MARINE CLAY)
SANDY TILL
BLUE-GREY MARINE CLAY
BASAL TILL
BEDROCK
MW-102B
MW-102A
TP-116
EXPLORATION TRENCH
LOWER LAGOON
MW-103B
MW-103A
TP-120
FENCE LINE
RIGGS BROOK
BEDROCK OUTCROP
BLUE-GREY MARINE CLAY (PRESUMPSCOT FORMATION)
BOB
LEGEND
BEDROCK FRACTURING WITHIN VICINITY OF BORINGS
GREATLY FRACTURE
SLIGHTLY FRACTURED (PREDOMINANTLY HORIZONTAL)
MASSIVE
WATER LEVEL (4/29/87)
OPEN CORED INTERVAL
BOB BOTTOM OF BORING
WELL SCREEN
TEST PIT
VERTICAL EXAGGERATION 5:1
0
40
80
160 FEET

NOTES:

1. SEE FIGURE 4-1 IN THE RI REPORT FOR LOCATION AND ORIENTATION OF PROFILES.
2. PROFILES ARE BASED ON AVAILABLE SUBSURFACE DATA. ACTUAL CONDITIONS BETWEEN EXPLORATIONS MAY VARY FROM THOSE SHOWN AND SEVERAL EXPLORATIONS PRESENTED HAVE BEEN PROJECTED ONTO THE CROSS-SECTIONS.

GEOLOGIC DESCRIPTIONS:

TILL:	NON-STRATIFIED DENSE AND VARIABLE DEPOSIT, RANGING FROM SILTS TO GRAVEL.
MARINE CLAY:	UNIFORM, SOFT, AND PLASTIC CLAY SIZE SEDIMENTS OF THE PRESUMPSCOT FORMATION
SANDY SILT:	STRATIFIED AND VARIABLE DEPOSIT OF PREDOMINANTLY SILTS WITH SOME SAND AND CLAY.
FILL:	HETEROGENEOUS MIXTURE OF CLAYS, SILTS, SANDS, AND GRAVEL.
BEDROCK:	QUARTZ MONZONITE AND ISOLATED QUARTZITE AND SCHIST LENSES (EXTENT OF FRACTURING INDICATED).

FIGURE 1-4
INTERPRETIVE GEOLOGIC PROFILE A-A'
F. O'CONNOR SITE
AUGUSTA, MAINE
E.C.JORDAN CO.

4963-24

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PCBs, more specifically Arochlor 1260, were identified in the unfiltered groundwater samples taken during the first round of sampling at 1.6 to 50 ppb (the higher concentrations were detected in well MW-104B located in the bedrock, and downgradient of TWA II). Additional rounds of samples taken from the five nested monitoring wells installed at the Site showed no detectable amounts of PCBs, while only one additional detectable concentration of PCBs was identified at 23 ppb in the single bedrock monitoring well (MW-104B; note that a duplicate of this same sample indicated no detectable PCB contamination).

Other organic compounds detected sporadically or otherwise were phthalates, primarily bis (2-ethylhexyl) phthalate, acetone, benzene, methylene chloride, 2-butanone, and toluene. Inorganics were analyzed during the first round of samples taken from the five monitoring wells. From these samples, lead was detected in only one well (MW-103B) at a concentration of 28 ppb.

A more complete description of the groundwater contaminants found at the Site, and information regarding the hydrogeologic characteristics of the Site, can be found in the RI report within Chapter 5.0.

C. Residential Well Water

Five (5) residential wells located within a one-half mile radius of the Site were selected for sampling and analysis as a result of a comprehensive domestic well survey conducted during the RI field work. The five domestic wells were all located to the northwest or southwest of the Site, and all wells were installed in the bedrock.

Analytical results from these five domestic wells indicated that no PCBs or organic chemicals were detected. The results obtained for inorganics identified lead in one of the wells at 65 ppb. This domestic well was located one-half mile upgradient (north-northeast) from the Site, and was reportedly not used for drinking water purposes but only for gardening.

A more complete description of the residential well water results and the well survey conducted around the Site can be found in Chapter 5.0 and Appendix D-7 of the RI report.

D. Surface Water

During the RI field efforts, surface water investigations were conducted both on and off the Site which included sampling and analysis and a hydrologic assessment. These investigations focused on the upland marsh, the upper lagoon and the lower lagoon located on the Site, and the Riggs Brook watershed.

Based on the hydrologic investigations of the surface waters in and around the Site, it was determined that flow from the on-site surface water features occurs directly into Riggs Brook via a central drainage swale. This flow, however, occurs only during seasonal recharge periods (spring and fall) and during major storm events. Additionally, the Riggs Brook watershed which is in close proximity to the Site only drains approximately 7 percent (1 square mile) of the entire 15 square mile drainage basin. However, since a narrow and shallow stream channel has been eroded and provides a limited flow capacity during flood periods within the Riggs Brook watershed nearest the Site, the wetland areas at the base of the Site flood during periods of heavy rain and/or snowmelt. Furthermore, the lower elevations of the Site (specifically, the above-mentioned wetlands and the lower lagoon) are approximately located within the 100-year floodplain designated by the Federal Emergency Management Agency (FEMA).

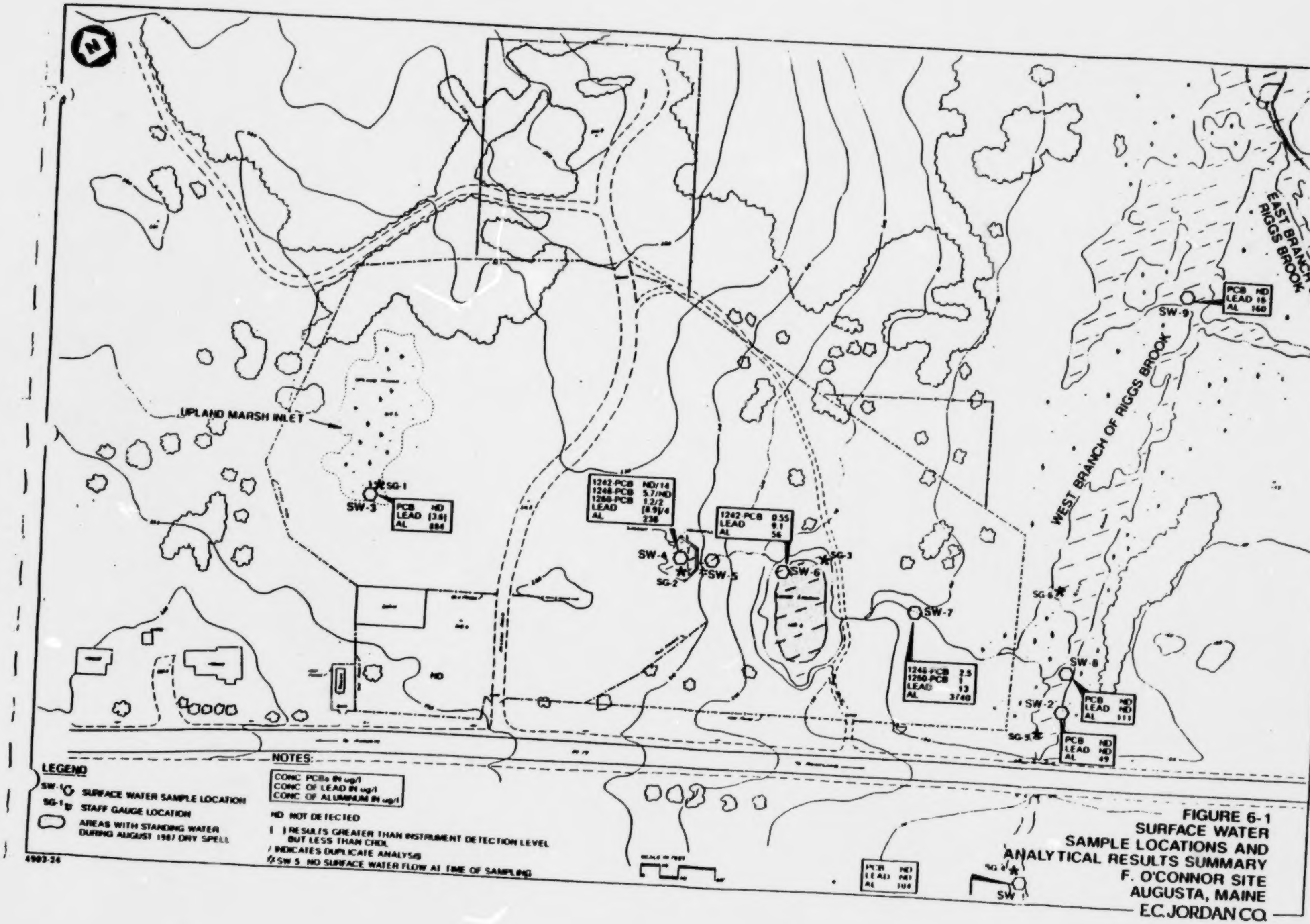
Surface water quality, as shown on Figure 6-1, was determined from several sampling locations both on and off the Site. These results indicated that PCBs (from unfiltered samples) were detectable in the upper and lower lagoons, and the lower lagoon drainage but were not detected in surface water samples taken from Riggs Brook. PCB concentrations in the on-site surface waters ranged from 0.55 ppb in the lower lagoon to 16 ppb in the upper lagoon. Other contaminants of concern in the on-site surface waters were the inorganic chemicals: lead and aluminum. While lead was only detected in one surface water sample within Riggs Brook at 16 ppb (located approximately 450 feet downstream of the Site, but not in samples nearest to the Site), lead was found at concentrations ranging from 3.6 to 13 ppb in all the on-site surface waters. Additionally, aluminum was detected in the on-site surface waters at concentrations ranging from 236 to 3,740 ppb.

A more complete discussion of the surface water hydrology of the Site and surrounding areas can be found in Chapter 6.0 of the RI report.

E. Sediment

The sediment sampling program established during the RI was performed in conjunction with the above-described surface water sampling program in order to collect pairs of samples for analysis within each of the major surface water bodies in the site-area. A total of 23 sediment samples were collected from 19 locations both on-site and within Riggs Brook.

10.a


N
EAST BRANCH OF RIGGS BROOK
WEST BRANCH OF RIGGS BROOK
UPLAND MARSH INLET
SW-1
SW-2
SW-3
SW-4
SW-5
SW-6
SW-7
SW-8
SW-9
SG-1
SG-2
SG-3
SG-4
SG-5
SG-6
PCB ND
LEAD 16
AL 160
PCB ND
LEAD [3.6]
AL 884
1242-PCB ND/14
1248-PCB 5.7/ND
1260-PCB 1.2/2
LEAD [0.9]/4
AL 236
1242-PCB 0.55
LEAD 9.1
AL 56
1248-PCB 2.5
1250-PCB 1
LEAD 13
AL 3740
PCB ND
LEAD ND
AL 111
PCB ND
LEAD ND
AL 49
PCB ND
LEAD ND
AL 104
4903-24

LEGEND

SW-1 ○ SURFACE WATER SAMPLE LOCATION

SG-1 ✱ STAFF GAUGE LOCATION

AREAS WITH STANDING WATER DURING AUGUST 1987 DRY SPELL

NOTES:

CONC PCBs IN ug/l
CONC OF LEAD IN ug/l
CONC OF ALUMINUM IN ug/l

ND NOT DETECTED

[ ] RESULTS GREATER THAN INSTRUMENT DETECTION LEVEL BUT LESS THAN CRDL

/ INDICATES DUPLICATE ANALYSIS

SW 5 NO SURFACE WATER FLOW AT TIME OF SAMPLING

FIGURE 6-1
SURFACE WATER
SAMPLE LOCATIONS AND
ANALYTICAL RESULTS SUMMARY
F. O'CONNOR SITE
AUGUSTA, MAINE
E.C.JORDAN CO.

As shown in Figure 7-1, PCBs were detected in the sediment samples obtained from the upland marsh, both on-site lagoons, and the lower lagoon drainage area leading into Riggs Brook. PCB concentrations were highest in the upper lagoon (up to 1,100 ppm), but decreased significantly with increased distance from this lagoon. PCB concentrations were lowest in the drainage area of the lower lagoon at approximately 4 ppm.

Concentrations of PCBs less than 5 ppm were found in the sediments within Riggs Brook immediately adjacent to the Site. The concentrations of PCBs in these sediments diminished rapidly with increasing distance from the Site to concentrations of less than 1 ppm.

Other contaminants detected in the sediment samples either from on- or off-site locations included PAHs and lead. However, these contaminants were determined to be either below typical background levels or more influenced by the proximity of the Site to U.S. Route 17 than by activities related to the Site.

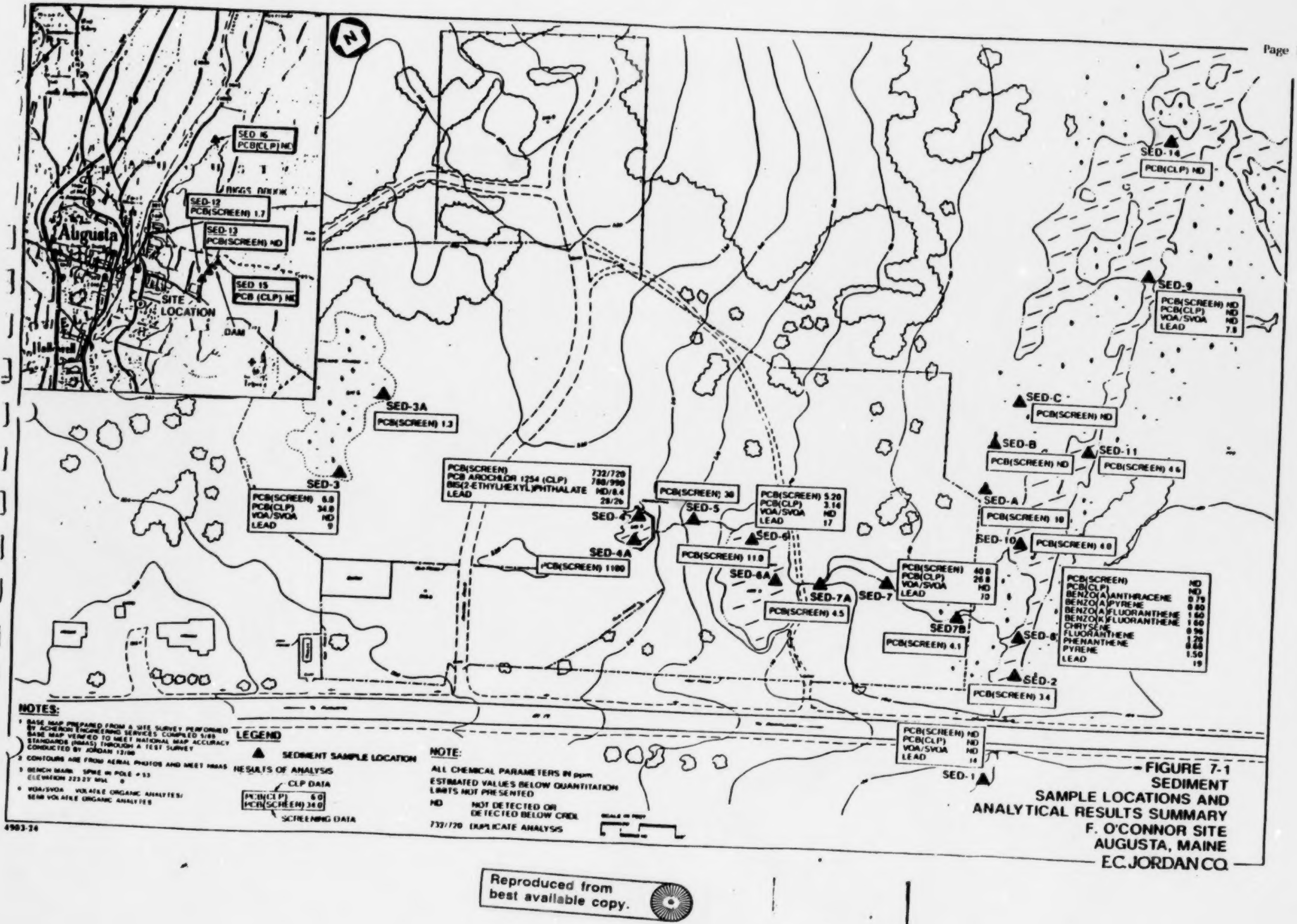
A more complete discussion of the sediment investigations and results can be found in Chapter 7.0 of the RI report.

F. Biota

An environmental evaluation was performed in and around the Site during the RI field efforts in order to evaluate whether conditions at the Site pose environmental risks to terrestrial and/or aquatic flora and fauna, and to establish baseline wetland conditions at the Site so that impacts from proposed remedial actions could be assessed during the Feasibility Study.

In addition to the above-described studies, biota sampling and analysis was performed both on- and off-site to quantify chemical concentrations within organisms indigenous to the Site. As shown on Figure 1-14, the biota sampling stations were located where site-related contaminants were previously detected in the surface waters and/or sediments, or in areas where deposition of eroded sediments was likely to have/had occurred.

The results of the biota analytical evaluation indicated a significant positive correlation between PCB tissue concentrations in the biota tested and PCB sediment concentrations at the locations sampled. For example, PCBs were detected as high as 161 ppm in tadpoles obtained from the upper lagoon where the PCB concentration of the sediments was 1,100 ppm. In contrast, the biota and sediment samples from Riggs Brook contained much lower PCB concentrations equal to or slightly above background (i.e., 0.18 to 0.74 ppm in fish, and


SED 16
PCB(CLP) ND
BIGGS BROOK
SED-12
PCB(SCREEN) 1.7
SED-13
PCB(SCREEN) ND
SED 15
PCB (CLP) ND
Augusta
Hallowell
SITE LOCATION
DAM
N
SED-14
PCB(CLP) ND
SED-9
PCB(SCREEN) ND
PCB(CLP) ND
VOA/SVOA ND
LEAD 7.8
SED-C
PCB(SCREEN) ND
SED-B
PCB(SCREEN) ND
SED-11
PCB(SCREEN) 4.6
SED-A
PCB(SCREEN) 10
SED-10
PCB(SCREEN) 4.0
SED-3A
PCB(SCREEN) 1.3
SED-3
PCB(SCREEN) 6.0
PCB(CLP) 34.0
VOA/SVOA ND
LEAD 9
PCB(SCREEN) 732/720
PCB AROCHLOR 1254 (CLP) 780/990
BIS(2-ETHYLHEXYL)PHTHALATE ND/8.4
LEAD 28/26
SED-4
SED-4A
PCB(SCREEN) 1100
SED-5
PCB(SCREEN) 30
SED-6
PCB(SCREEN) 5.20
PCB(CLP) 3.14
VOA/SVOA ND
LEAD 17
PCB(SCREEN) 11.0
SED-6A
SED-7A
PCB(SCREEN) 4.5
SED-7
PCB(SCREEN) 40.0
PCB(CLP) 26.8
VOA/SVOA ND
LEAD 70
SED7B
PCB(SCREEN) 4.1
SED-8
PCB(SCREEN) ND
PCB(CLP) ND
BENZO(A)ANTHRACENE 0.79
BENZO(A)PYRENE 0.80
BENZO(A)FLUORANTHENE 1.60
BENZO(K)FLUORANTHENE 1.60
CHRYSENE 0.96
FLUORANTHENE 1.20
PHENANTHENE 0.68
PYRENE 1.50
LEAD 19
SED-2
PCB(SCREEN) 3.4
PCB(SCREEN) ND
PCB(CLP) ND
VOA/SVOA ND
LEAD 14
SED-1
SCALE IN FEET

NOTES:

1. BASE MAP PREPARED FROM A SITE SURVEY PERFORMED BY ACHERON ENGINEERING SERVICES COMPILED 5/88 BASE MAP VERIFIED TO MEET NATIONAL MAP ACCURACY STANDARDS (NMAS) THROUGH A TEST SURVEY CONDUCTED BY JORDAN 12/88
2. CONTOURS ARE FROM AERIAL PHOTOS AND MEET NMAS
3. BENCH MARK SPIKE IN POLE # 53 ELEVATION 223.27 MSL
4. VOA/SVOA VOLATILE ORGANIC ANALYTES/ SEMI VOLATILE ORGANIC ANALYTES

LEGEND

▲ SEDIMENT SAMPLE LOCATION

RESULTS OF ANALYSIS

CLP DATA
PCB(CLP) 6.0
PCB(SCREEN) 34.0
SCREENING DATA

NOTE:

ALL CHEMICAL PARAMETERS IN ppm

ESTIMATED VALUES BELOW QUANTITATION LIMITS NOT PRESENTED

ND NOT DETECTED OR DETECTED BELOW CRDL

732/720 DUPLICATE ANALYSIS

4903-24

FIGURE 7-1
SEDIMENT
SAMPLE LOCATIONS AND
ANALYTICAL RESULTS SUMMARY
F. O'CONNOR SITE
AUGUSTA, MAINE
E.C.JORDAN CO.

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less than 5 ppm in sediments).

A more complete discussion of the biota studies undertaken at the Site can be found in the RI report within Chapter 8.0.

VI. SUMMARY OF SITE RISKS

An Endangerment Assessment (EA) was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to the contaminants associated with the Site. Twelve (12) contaminants of concern, as shown in Table 1, were selected for evaluation in the EA. These contaminants constitute a representative subset of the many other contaminants that were identified at the Site during the Remedial Investigation. These 12 contaminants were selected to represent the potential hazards at the Site based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment.

Potential human health effects associated with the contaminants of concern in soils, sediments, air, biota (fish), and groundwater were estimated quantitatively through the development of several hypothetical exposure scenarios. Potential carcinogenic risks and a measure of the potential noncarcinogenic adverse health effects were estimated for each of the various exposure scenarios developed. Exposure scenarios were developed to reflect the potential for exposure to hazardous substances based on the characteristic uses and location of the Site. Factors of special note that are reflected in the Endangerment Assessment are that the Site is presently enclosed by a six-foot high chain link fence, that most residents within this primarily residential neighborhood obtain their drinking water from the Augusta Water District, and that fishing within Riggs Brook is on an occasional basis and only smaller fish are likely to be caught and consumed by people. Tables 2, 3, 4, and 5 present the assumptions used in the EA to approximate the current and potential future exposures to the contaminants of concern identified at the Site.

As summarized in the Chapter 3.0 of the Feasibility Study (FS) report, seven exposure scenarios were identified in the quantitative risk evaluation section of the Endangerment Assessment as posing potential risks to human health or the environment as follows:

- direct contact with soils by children;
- inhalation of vapors from surface soils;
- ingestion of fish caught in Riggs Brook;
- future direct contact with soils by on-site inhabitants;
- future direct contact with sediments in the lower lagoon by children;
- future inhalation of vapors by on-site inhabitants; and,
- future ingestion of groundwater from within the bedrock.

TABLE 1

SUMMARY OF POTENTIAL RISKS ASSOCIATED WITH HUMAN EXPOSURE TO CHEMICALS OF CONCERN FROM THE O'CONNOR SITE[a]

Pathway/Chemical	Frequency	CDI:RfD Index for Noncarcinogenic Effects		Lifetime Upper Bound Excess Cancer Risk	
		Average	Maximum	Average	Maximum
Direct Contact with Soils by Children					
PCBs	115/186	NQ[b]	NQ	4×10^{-8}	3×10^{-3}
cPAHs	3/9	NQ	NQ	3×10^{-8}	2×10^{-5}
Cadmium	14/19	3×10^{-5}	1×10^{-2}	NQ	NQ
Copper	19/19	6×10^{-5}	6×10^{-2}	NQ	NQ
Lead	19/19	3×10^{-3}	4×10^{-1}	NQ	NQ
Nickel	19/19	3×10^{-5}	7×10^{-4}	NQ	NQ
Zinc	19/19	7×10^{-6}	4×10^{-4}	NQ	NQ
TOTAL RISK		3×10^{-3}	5×10^{-1}	7×10^{-8}	3×10^{-3}
Inhalation of Particulates from Surface Soil[c]					
PCBs	115/186	NQ	NQ	6×10^{-9}	NQ
cPAHs	3/9	NQ	NQ	2×10^{-9}	NQ
Cadmium	14/19	NQ	NQ	3×10^{-9}	NQ
Nickel	19/19	NQ	NQ	7×10^{-9}	NQ
Copper	19/19	7×10^{-6}	NQ	NQ	NQ
TOTAL RISK		7×10^{-6}	NQ	2×10^{-8}	NQ
Inhalation of Vapors from Surface Soil[c]					
PCBs	115/186	NQ	NQ	8×10^{-6}	NQ
cPAHs	3/9	NQ	NQ	2×10^{-8}	NQ
TOTAL RISK		NQ	NQ	8×10^{-6}	NQ
Ingestion of Fish Caught in Riggs Brook					
PCBs	39/39	NQ	NQ	2×10^{-6}	4×10^{-5}
Future Contact with Soils by Inhabitants On-site					
PCBs	115/186	NQ	NQ	8×10^{-7}	1×10^{-1}
cPAHs	3/9	NQ	NQ	6×10^{-7}	8×10^{-4}
Cadmium	14/19	1×10^{-4}	1×10^{-1}	NQ	NQ
Copper	19/19	2×10^{-4}	8×10^{-1}	NQ	NQ
Lead	19/19	1×10^{-2}	$5\times10^{+0}$	NQ	NQ
Nickel	19/19	1×10^{-4}	1×10^{-2}	NQ	NQ
Zinc	19/19	2×10^{-5}	6×10^{-3}	NQ	NQ
TOTAL RISK		1×10^{-2}	$6\times10^{+0}$	1×10^{-6}	1×10^{-1}

13AA

TABLE 1 (Continued)

SUMMARY OF POTENTIAL RISKS ASSOCIATED WITH HUMAN EXPOSURE TO CHEMICALS OF CONCERN FROM THE O'CONNOR SITE[a]

Pathway/Chemical	Frequency	CDI:RfD Index for Noncarcinogenic Effects		Lifetime Upper Bound Excess Cancer Risk	
		Average	Maximum	Average	Maximum
Future Contact with Sediments by Children In Lower Lagoon					
PCBs	7/7	NQ	NQ	4×10^{-7}	5×10^{-5}
Copper	2/2	8×10^{-6}	3×10^{-4}	NQ	NQ
Lead	2/2	5×10^{-4}	2×10^{-2}	NQ	NQ
Manganese	2/2	3×10^{-5}	9×10^{-4}	NQ	NQ
Zinc	2/2	6×10^{-6}	2×10^{-4}	NQ	NQ
TOTAL RISK		5×10^{-4}	2×10^{-2}	4×10^{-7}	5×10^{-5}
Future Inhalation of Vapors by Inhabitants On-site					
PCBs	115/186	NQ	NQ	2×10^{-4}	NQ
cPAHs	3/9	NQ	NQ	4×10^{-7}	NQ
TOTAL RISK		NQ	NQ	2×10^{-4}	NQ
Future Ingestion of Groundwater from Bedrock Aquifer					
Benzene	2/20	NQ	NQ	NQ	4×10^{-6}
1,4-Dichlorobenzene	6/20	NQ	NQ	5×10^{-6}	3×10^{-5}
DEHP	13/20	NQ	NQ	2×10^{-7}	1×10^{-6}
PCBs	3/20	NQ	NQ	2×10^{-4}	1×10^{-2}
Chromium	4/10	0.03	0.2	NQ	NQ
Manganese	8/10	0.1	0.8	NQ	NQ
TOTAL RISK		0.1	1.0	2×10^{-4}	1×10^{-2}

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[a] The chemicals presented in this table are those that significantly contribute to the overall carcinogenic and noncarcinogenic risk for a particular pathway. Except where noted, all pathways are current-use scenarios.

[b] NQ - Not Quantified

[c] Risks given are those for the wind direction toward the Augusta population center at 100m from the O'Connor site.

Source: Endangerment Assessment for the O'Connor Site in Augusta, Maine, (Table 8-1) ICF - Clement, Inc., January 1988.

Table 2

ASSUMPTIONS FOR USE IN THE EXPOSURE ASSESSMENT FOR DIRECT CONTACT WITH SOIL BY CHILDREN AT THE F. O'CONNOR SITE

(current-use scenario)

Parameter	Average Exposure	Plausible Maximum Exposure
Age of Children Exposed	6-11 years	6-11 years
Frequency of Exposure	24 events/yr	48 events/yr
Duration of exposure	5 years	5 years
Average body weight over period of exposure	30 Kg	30 Kg
Incidental ingestion of contaminated soil[a]	50 mg/visit	250 mg/visit
Percent of PCBs and cPAHs absorbed from ingested soil[b]	15%	45%
Percent of inorganic chemicals absorbed from ingested soil	100%	100%
Soil contact rate for use in dermal absorption estimate	0.25 g/visit	3.5 g/visit
Percent of organic compound absorbed dermally from skin	1%	3%
Percent of inorganic compound absorbed dermally from skin	negligible	negligible
Average lifetime	70 years	70 years

[a] Lagoy (1987).

[b] Based on analogy to tetrachlorodibenzo-p-dioxin: Umbreit et al. (1986), McConnell et al. (1986), and Poiger and Schlatter (1980).

Table 3

ASSUMPTIONS FOR USE IN THE EXPOSURE ASSESSMENT FOR INHALATION OF SURFACE SOIL INDICATOR CHEMICALS BY RESIDENTS LIVING NEAR THE F. O'CONNOR SITE

Age	Years[a] Exposed	Ventilation rate[b] (m^3/day)	Body weight[b] (kg)
0 - 2	3	1.1	11.7
3 - 6	4	25	15.5
7 - 10	4	29	30.7
11 - 18	7	28	61.2
19 - 70	52	26	70

[a] Inhalation exposure is assumed to occur every day; however, the total calculated inhahaltion exposure to vapors is reduced by a factor of two to adjust for the winter six-month period when volatilization is negligible due to cold air and soil temperatures.

[b] Based on ventilation rates and body weights for males

Table 4

EXPOSURE AND RISK ASSESSMENT FOR CONSUMPTION OF FRESHWATER FISH FROM RIGGS BROOK

PCB concentrations in edible tissue :
Average case: 0.54 mg/Kg (geometric mean)
Plausible Maximum case: 0.74 mg/Kg (highest measured concentration)

Exposure scenario 1: (average case)

Consumption of fish (150 g/serving) from Riggs Brook once a year for 5 years.

Exposure scenario 2: (plausible maximum case)

Consumption of fish (150 g/serving) from Riggs Brook 10 times per year for 10 years.

Table 5

ASSUMPTIONS FOR THE FUTURE USE EXPOSURE SCENARIO FOR DIRECT SOIL CONTACT AT THE F. O'CONNOR SITE

Parameter	Average Exposure	Plausible Maximum Exposure
Area of exposed skin (m^2):		
1-5 years	0.039	0.151
6-11	0.052	0.230
12-18	0.084	0.370
19-70	0.214	0.449
Soil dermal contact (g/day):		
1-5 years	0.20	2.3
6-11	0.25	3.5
12-18	0.42	5.6
19-70	1.07	6.7
Body weight (kg):		
1-5 years	15	15
6-11	30	30
12-18	54	54
19-70	65	65
Frequency of exposure:	100 events/year	200 events/year
Incidental ingestion of contaminated soil[a]:		
1-5 years	100 mg/day	500 mg/day
6-11	50	250
12-18	25	100
19-70	25	100

[a] Lagoy 1987

Based upon the risk assessment methodology/guidelines contained in the Superfund Public Health Evaluation Manual (EPA, 1986), the potential risks for the seven exposure scenarios noted above were estimated as shown in Table 1. These potential risks were estimated for the average (defined as exposure to the geometric mean concentrations of individual contaminants detected at the Site), and the maximum exposure case (defined as exposure to the maximum concentration found at the Site for the particular media, i.e., soil, being assessed). The major conclusions drawn from the Endangerment Assessment are summarized below:

* direct contact with, ingestion of, or inhalation of vapors from soils contaminated with PCBs and cPAHs may pose an incremental increased cancer risk over a lifetime of exposure. Children potentially playing on the Site currently, or future residents living on the Site would be at the greatest risk. Lead in soils may also pose a risk of adverse, noncarcinogenic health effects (through direct contact and ingestion) by potential future residents living at the Site.

* an increased cancer risk over a lifetime of exposure may also be associated with direct contact and ingestion by children with the PCB-contaminated sediments in the lagoons located on the Site.

* ingestion of the contaminated groundwater from the deep/bedrock system under the Site may pose potential long-term risks to future inhabitants of the Site. Contaminants of concern are 1,4-dichlorobenzene, benzene, and PCBs.

* environmental risks to biota (i.e., fish, wildlife and plants) exposed to the contaminated soils, sediments, or surface waters at the Site may potentially exist from the presence of PCBs, lead, and aluminum.

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or, the environment.

A more complete discussion of the methodologies, and potential human health and environmental risks posed by the Site can be found in the Endangerment Assessment report (dated January 1988) or summarized in Chapter 3.0 of the FS report.

VII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

EPA adopted a proposed plan (preferred alternative) for remediation of the Site on July 12, 1989. The source control portion of the preferred alternative essentially included on-site solvent extraction of those on-site soils and sediments contaminated with PCBs, cPAHs and lead, on-site or off-site disposition (landfilling) of those solid residues resulting from the solvent extraction process that continue to be hazardous and/or will exceed target cleanup goals, and collection and off-site treatment of the contaminated surface water found within the on-site lagoons and upland marsh. The management of migration portion of the preferred alternative essentially included collection and on-site treatment of the contaminated groundwater existing on the Site, and minimal no-action for those localized, PCB-contaminated sediments found within Riggs Brook.

No significant changes from the proposed plan briefly described above have been made to the selected remedy as detailed in this Record of Decision. However, at the time of the issuance of the proposed plan, EPA had not made a final determination as to whether solvent extraction treatment residues would be landfilled on-site or off-site, and specifically requested public comment on that issue. As discussed in further detail in Sections X, XI, and XII of this ROD, EPA has since selected the option of off-site landfilling of those solid residues noted above to satisfy the statutory preference for treatment, while at the same time achieving a higher degree of protectiveness. Furthermore, this decision will be consistent with the overall scope and role of this response action and will be cost-effective. Additionally, this final determination addresses both State and community concerns raised during the public comment period with respect to the siting of a landfill within the city limits of Augusta, Maine.

VIII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. Statutory Requirements/Response Objectives

Prior to the passage of the Superfund Amendments and Reauthorization Act of 1986 (SARA), actions taken in response to releases of hazardous substances were conducted in accordance with CERCLA as enacted in 1980 and the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300 (1988), promulgated in the Federal Register on November 20, 1985. Although EPA proposed revisions on December 21, 1988, to the NCP to reflect SARA, until those proposed revisions are finalized, the procedures and standards for responding to releases of hazardous substances, pollutants and contaminants shall be in accordance with Section 121 of CERCLA (as amended by SARA) and to the maximum extent practicable, the current NCP.

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: (1) a requirement that EPA's remedial action, when complete, comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is invoked; (2) a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (3) a statutory preference for remedies that permanently and significantly reduce the volume, toxicity or mobility of hazardous substances over remedies that do not achieve such results through treatment. Response alternatives were developed to be consistent with these Congressional mandates.

A number of exposure pathways were quantitatively analyzed for their potential risk and threats to human health and the environment in the Endangerment Assessment (which included a Wetland/Ecological Assessment). Guidelines in the Superfund Public Health Evaluation Manual (EPA, 1986) regarding development of risk analyses for remedial alternatives were used to assist EPA in the development of response actions. As a result of these assessments, remedial response objectives were developed to mitigate existing and future threats to human health and the environment. These response objectives are:

1. Reduce potential present and future public health and environmental risks from direct contact, ingestion, and/or dermal absorption with the PCB-, cPAH-, and lead-contaminated soils and sediments located on- and off-site.

2. Reduce potential present and future public health risks from the inhalation of PCB vapors from the Site.

3. Reduce potential present and future public health risks from the ingestion of PCB-contaminated fish from Riggs Brook.

4. Reduce potential future public health risks from the ingestion of PCB-, benzene-, and 1,4-dichlorobenzene-contaminated groundwater found on the Site.

5. Reduce potential present and future environmental risks to aquatic and terrestrial wildlife from exposures to the PCB-, lead-, and aluminum-contaminated on-site surface water.

B. Technology and Alternative Development and Screening

CERCLA, the NCP, and EPA guidance documents, including the "Guidance on Feasibility Studies Under CERCLA" dated June 1985, the "Interim Guidance on Superfund Selection of Remedy" [EPA Office of Solid Waste and Emergency Response (OSWER)], Directive No. 9355.0-19 (December 24, 1986), and the Interim Final "Guidance for Conducting RIs and FSs under CERCLA," OSWER Directive No. 9355.3-01 (October 1988), set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements and guidance documents, a range of treatment alternatives, a containment option involving little or no treatment, and a no-action alternative were developed for the Site.

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, EPA is required to consider in its assessment of alternatives. In addition to these factors and the other statutory directives of Section 121 of CERCLA, the evaluation and selection process was guided by the EPA document "Additional Interim Guidance for FY '87 Records of Decision," OSWER Directive No. 9355.0-21, dated July 24, 1987. This document provides direction on the consideration of SARA cleanup standards and sets forth nine factors that EPA should also consider in its evaluation and selection of remedial actions. The nine factors are:

1. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs).
2. Long-term Effectiveness and Permanence.
3. Reduction of Toxicity, Mobility or Volume.

4. Short-term Effectiveness.

5. Implementability.

6. Community Acceptance.

7. State Acceptance.

8. Cost.

9. Overall Protection of Human Health and the Environment.

Chapter 4.0 of the Feasibility Study identified, assessed and screened technologies based on effectiveness (i.e., technical performance) and implementability (i.e., engineering feasibility). These technologies were combined into source control (SC) and management of migration (MM) alternatives. Chapter 5.0 of the Feasibility Study presented the remedial alternatives developed by combining the technologies identified from the previous screening process into the categories required by OSWER Directive No. 9355.0-19. An initial screening of these alternatives was also conducted in Chapter 5.0 of the Feasibility Study to narrow the number of potential remedial alternatives for further detailed analysis while preserving a range of options. Each remaining alternative was then evaluated in Chapter 6.0, 7.0 or 8.0 of the Feasibility Study.

In summary, of the 17 source control and management of migration remedial alternatives initially screened in Chapter 5.0, 14 were retained for detailed analysis. Table 6 identifies the 14 remedial alternatives that were retained through this initial screening process, as well as those that were eliminated from further consideration based upon their effectiveness, implementability, and cost.

TABLE 6

SUMMARY OF REMEDIAL ALTERNATIVES RETAINED FOR DETAILED ANALYSIS
O'CONNOR SITE
AUGUSTA, MAINE

TYPE/RESPONSE CATEGORY	ALTERNATIVE	RETAINED	ELIMINATED *
Source Control Alternatives			
No Action	SC-1: Minimal No-action	X	
Containment	SC-2: Site Capping	X	
Containment/Disposal	SC-3: On-site Disposal Facility	X	
Disposal	SC-4: Off-site Disposal at TSCA Landfill	X	
Treatment	SC-5: On-site Incineration	X	
Treatment	SC-6: On-site Solidification	X	
Treatment	SC-7: On-site Vitrification	X	
Treatment	SC-8: In-situ Solidification		X
Treatment	SC-9: In-situ Vitrification		X
Treatment	SC-10: Alkali Metal Dechlorination	X	
Treatment	SC-11A: Solvent Extraction w/On-site Disposal of Treated Soil	X	
Treatment	SC-11B: Solvent Extraction w/Off-site Disposal of Contaminated Lead Soil	X	
Management of Migration Alternatives			
No-Action	MM-1: Minimal No-action	X	
Treatment	MM-2: Groundwater Extraction and Off-site Treatment		X

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TABLE 6 (Continued)

SUMMARY OF REMEDIAL ALTERNATIVES RETAINED FOR DETAILED ANALYSIS
O'CONNOR SITE
AUGUSTA, MAINE

TYPE/RESPONSE CATEGORY	ALTERNATIVE	RETAINED	ELIMINATED *
Treatment	MM-3: Groundwater Extraction and On-site Treatment with Activated Carbon Adsorption/ Injection to Groundwater	X	
Sediment Alternatives			
No-Action	SE-1: Minimal No-action	X	
Disposal	SE-2: Excavation and Off-site Disposal of PCB-contaminated Sediments from Riggs Brook	X	

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*The rationale for the elimination of these alternatives is provided in detail within Chapter 5.0 of the FS.

IX. DESCRIPTION/SUMMARY OF THE DETAILED AND COMPARATIVE ANALYSIS OF ALTERNATIVES

This section presents a narrative summary and brief evaluation of each remedial alternative according to the evaluation criteria described above.

A detailed tabular, comparative assessment of each alternative can be found in Tables 7 through 9 of this ROD. As noted in these tables, information regarding two of the nine criteria (i.e., State and Community Acceptance) that are required to be evaluated for each of the remedial alternatives undergoing the detailed analysis phase are typically only available during the later stages of the ROD process. These two "modifying" criteria, as described in the proposed NCP (1988), are not included in the discussions below for each alternative, but are presented in Appendix A (Responsiveness Summary) and discussed in Section X of the ROD.

A. Source Control (SC) Alternatives Analyzed

The source control alternatives analyzed for the Site include a minimal no-action alternative (SC-1); capping (SC-2); on-site disposal facility (SC-3); off-site disposal at TSCA landfill (SC-4); on-site incineration (SC-5); on-site solidification (SC-6); on-site vitrification (SC-7); alkali metal dechlorination (SC-10); on-site solvent extraction and disposal of treated soils (SC-11A); and on-site solvent extraction and off-site disposal of lead-contaminated soils (SC-11B). Note that the estimated times and costs presented below are taken directly from the FS which appear to be within +50 percent to -30 percent accuracy required for these FS estimates.

SC-1
Minimal No-Action

This source control alternative would involve no remedial action on any of the contaminated soils, sediments, or surface waters found at the Site. This alternative would, however, entail maintaining the existing fence and warning signs on the Site; establishing institutional controls (such as restricting future land use); conducting public education (awareness) programs; monitoring soils, sediments and surface waters, and reviewing Site conditions every five years for as long as hazardous wastes remain on-site above acceptable levels.

This alternative is included in the Feasibility Study (FS), as required by CERCLA, to serve as a basis for comparison with the other source control alternatives being considered. This alternative would not provide overall protection of human health

TABLE 7

COMPARATIVE ANALYSIS OF SOURCE CONTROL ALTERNATIVES

O'CONNOR SITE
AUGUSTA, MAINE

Alternative	Description/ Approx. Cost[1]	Reduction of Mobility, Toxicity, or Volume	Overall Protection of Public Health and the Environment (Effectiveness)[2]	Implementability	Community and State Acceptance[3]	ARARs
SC-1: Minimal No-action	No-action $920,000	Minimal reduction in toxicity, mobility, and/or volume (TMV) associated with natural attenuation.	Provides minimal level of protection of public health through use of institutional controls.	Easily implemented. Requires long-term enforcement of institutional controls.		Does not attain ARARs
			Does not mitigate on-going impacts on the surrounding environment.	Not a permanent remedy; therefore, requires 5-year re-evaluation program.		
SC-2: Site Capping	Containment $2,000,000	Does not reduce TMV of soil and on-site sediment contaminants since no treatment employed to maximum extent practicable.	Provides protection of public health through mitigation of direct contact and inhalation hazards.	Relatively easy to implement, using conventional construction equipment and techniques.		Achieves all ARARs.
		Reduces TMV of on-site surface water contaminants through off-site treatment.	Provides some protection of surrounding environment by reducing off-site migration of contaminants.	Numerous contractors are available. Not a permanent remedy; therefore, requires 5-year re-evaluation program.		

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TABLE 7 (Continued)

COMPARATIVE ANALYSIS OF SOURCE CONTROL ALTERNATIVES

O'CONNOR SITE
AUGUSTA, MAINE

Alternative	Description/ Approx. Cost[1]	Reduction of Mobility, Toxicity, or Volume	Overall Protection of Public Health and the Environment (Effectiveness)[2]	Implementability	Community and State[3] Acceptance	ARARs
SC-3: On-site Disposal Facility	Containment $4,400,000	Does not reduce TMV of soil and on-site sediment contaminants since no treatment employed to maximum extent practicable.	Provides protection of public health through mitigation of direct contact and inhalation hazards.	Relatively easy to implement, although uses some specialized construction materials and techniques.		ARARs would be met.
		Reduces TMV of on-site surface water contaminants through off-site treatment.	Provides protection of surrounding environment by controlling off-site migration of contaminants.	Several contractors are available. Not a permanent remedy; therefore, requires 5-year re-evaluation program.		
SC-4: Off-site Disposal at TSCA Landfill	Off-site Disposal $15,000,000	Does not reduce TMV of soil and on-site sediment contaminants since no treatment employed to maximum extent practicable.	Provides protection of public health and the surrounding environment by removing the contaminants from the site.	Easy to implement. Several contractors are available. Availability of TSCA landfill capacity may be a problem.		ARARs would be met.
		Reduces TMV of on-site surface water contaminants through off-site treatment.		Involves transportation of wastes over long distances. Would be a "clean closure"; therefore, the 5-year re-evaluation program would not be required.		

TABLE 7 (Continued)

COMPARATIVE ANALYSIS OF SOURCE CONTROL ALTERNATIVES

O'CONNOR SITE
AUGUSTA, MAINE

Alternative	Description/ Approx. Cost[1]	Reduction of Mobility, Toxicity, or Volume	Overall Protection of Public Health and the Environment (Effectiveness)[2]	Implementability	Community and State Acceptance[3]	ARARs
SC-5: On-site Incineration	On-site Treatment $19,000,000	Reduces toxicity, mobility, and volume of organic contaminants in soil and on-site sediments through on-site treatment. Reduces TMV of on-site surface water contaminants through off-site treatment.	Organic contaminants are destroyed, effectively eliminating their long-term threat to public health and the environment. Provides protection of local human and environmental receptors from inorganics by removing them from the site. May result in increased short-term impacts due to air emissions from on-site incinerator.	Requires special equipment that is available from several vendors. Effectiveness of the on-site incinerator must be demonstrated through test burns. Relatively complex operation with potential for technical problems during implementation. Involves some long-distance transportation of wastes. Treated wastes would remain on-site; therefore, 5-year review is required unless treated soil is delisted.		ARARs would be met.
SC-6: On-site Solidification	On-site Treatment $4,100,000	Reduces mobility of soil and on-site sediment contaminants through on-site treatment. Volume will increase following treatment of soils and on-site sediments. Reduces TMV of on-site surface water contaminants through off-site treatment.	Wastes are treated, reducing the threat to public health and the environment.	Relatively easy to implement. Several contractors have solidification experience; proprietary chemicals questioned. Potential for technical problems to develop during implementation due to the innovative status of the technology. Treated wastes would remain on-site; therefore, requires 5-year re-evaluation program.		Achieves all ARARs. Would need to demonstrate that treated soil and sediments were permanently rendered non-hazardous.

TABLE 7 (Continued)

COMPARATIVE ANALYSIS OF SOURCE CONTROL ALTERNATIVES

O'CONNOR SITE
AUGUSTA, MAINE

Alternative	Description/ Approx. Cost[1]	Reduction of Mobility, Toxicity, or Volume	Overall Protection of Public Health and the Environment (Effectiveness)[2]	Implementability	Community and State Acceptance[3]	ARARs
SC-7: On-site Vitrification	On-site Treatment $19,800,000	Reduces toxicity, mobility, and volume of soil and on-site sediments through on-site treatment. Reduces TMV of on-site surface water contaminants through off-site treatment.	Wastes are treated and rendered permanently non-hazardous, effectively eliminating the long-term threat to public health and the environment. May result in increased short-term impacts due to air emissions.	The technology has not yet been applied to an actual site clean-up. Full-scale equipment is still under development. There will be a significant potential for technical problems during implementation of an undemonstrated technology. There are currently only two vendors of the process. Treated wastes would remain on-site; therefore, requires 5-year re-evaluation program.		Achieves all ARARs. Would need to demonstrate that treated soil and sediments were permanently rendered non-hazardous.
SC-10: On-site Alkali Metal Dechlorination	On-site Treatment $9,900,000	Reduces toxicity and volume of PCBs in soil and on-site sediments. Not known to reduce toxicity, mobility, or volume of PAHs or inorganics in soil. Reduces TMV of on-site surface water contaminants through off-site treatment.	PCBs are chemically converted to less toxic compounds, reducing the risk to public health and the environment. May not provide protection of public health and the environment from PAHs or inorganics unless off-site disposal of soils with these contaminants is included.	The technology has not yet been applied to an actual site clean-up. Full-scale equipment is still under development. There will be a significant potential for technical problems during implementation of an undemonstrated technology. There is currently only one commercial vendor developing this process. Treated wastes would remain on-site; therefore, the 5-year re-evaluation program is required.		Achieves all ARARs. Would need to demonstrate that treated soil and sediments were permanently rendered non-hazardous.

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TABLE 7 (Continued)

COMPARATIVE ANALYSIS OF SOURCE CONTROL ALTERNATIVES

O'CONNOR SITE
AUGUSTA, MAINE

lternative	Description/ Approx. Cost[1]	Reduction of Mobility, Toxicity, or Volume	Overall Protection of Public Health and the Environment (Effectiveness)[2]	Implementability	Community and State[3] Acceptance	ARARs
C-11A olvent xtraction	On-site Treatment SC-11A: $13,000,000	Selected Remedy; criteria discussed and compared to all other alternatives within Section X and XI of the ROD.	Selected Remedy; criteria discussed and compared to all other alternatives within Section X and XI of the ROD.	Selected Remedy; criteria discussed and compared to all other alternatives within Section X and XI of the ROD.		Selected Remedy; criteria discussed and compared to all other alternatives within Section X and XI of the ROD.
C-11B olvent xtraction	On-site Treatment SC-11B: $5,900,000	Reduces toxicity, mobility, and volume of organic contaminants in soil and on-site sediments through on-site treatment. Reduction in toxicity, mobility, or volume of inorganic contaminants in soil is not demonstrated. Reduces TMV of on-site surface water contaminants through off-site treatment.	Organic contaminants are removed from the soil and destroyed off-site; however, residual organic contaminants remaining on the site following treatment may present long-term threats to public health and the environment, and long-term permanence of the soil cover is uncertain. May not provide protection of public health and the environment from inorganic contaminants unless off-site disposal of lead-contaminated soil is included.	Full-scale operation of this technology has occurred at a Superfund Site. There are currently only two vendors developing full-scale treatment units. Treated wastes would remain on-site; therefore, the 5-year re-evaluation program is required.		Achieves all ARARs. Would need to demonstrate that treated soil and sediments were permanently rendered non-hazardous.

[1] Total Cost (Present Worth)

[2] This category subsumes the three distinct categories of overall protection of human health and the environment, long-term effectiveness and permanence, and short-term effectiveness.

[3] Presentations of these two criteria are provided in Appendix A (Responsiveness Summary) and discussed in Section X of this ROD

TABLE 8

COMPARATIVE ANALYSIS OF MANAGEMENT OF MIGRATION ALTERNATIVES

O'CONNOR SITE
AUGUSTA, MAINE

Alternative	Description/ Approx. Cost[1]	Reduction of Mobility, Toxicity, or Volume	Overall Protection of Public Health and the Environment (Effectiveness)[2]	Implementability	Community and State Acceptance[3]	ARARs
MM-1: Minimal No-action	No-action $670,000	No reduction in toxicity, mobility, and/or volume (TMV) of contaminants.	Relies on institutional controls to prevent the future use of potentially contaminated groundwater by the public. Does not eliminate potential for degradation of downgradient groundwater.	Easily implemented. Requires long-term enforcement of institutional controls. Not a permanent remedy; therefore, requires 5-year re-evaluation program.		Achieves ARARs
MM-3: Groundwater Extraction with On-site Treatment	On-site Treatment $680,000	Reduces TMV of groundwater contaminants through on-site treatment.	Provides protection of public health and the surrounding environment by capturing contaminants in groundwater before they migrate off-site. The efficiency of the extraction system for recovering contaminants in the groundwater is difficult to predict.	Relatively easy to implement. Requires a long-term operation, monitoring and maintenance program.		Achieves ARARs

[1] Total Cost (Present Worth)

[2] This category subsumes the three distinct categories of overall protection of human health and the environment, long-term effectiveness and permanence, and short-term effectiveness.

[3] Presentations of these two criteria are provided in Appendix A (Responsiveness Summary) and discussed in Section X of this ROD.

TABLE 9

COMPARATIVE ANALYSIS OF RIGGS BROOK SEDIMENT ALTERNATIVES

O'CONNOR SITE
AUGUSTA, MAINE

Alternative	Description/ Approx. Cost[1]	Reduction of Mobility, Toxicity, or Volume	Overall Protection of Public Health and the Environment (Effectiveness)[2]	Implementability	Community and State[3] Acceptance	ARARs
SE-1: Minimal No-action	No-action $223,000	Minimal reduction in mobility, toxicity, and/or volume associated with natural attenuation.	Relies on long-term monitoring to ensure that risks to public health and the environment do not increase to unacceptable levels.	Long-term monitoring is easily implemented. Not permanent remedy; therefore, requires 5-year re-evaluation program.		Achieves ARARs.
SE-2: Excavation and Off-site Disposal of PCB-contaminated Sediments	Off-site Disposal $291,000	No reduction in TMV since no treatment is employed.	Provides long-term protection of public health by removing the contaminants from the site. Results in extensive short-term (and potential long-term) damage to the wetland ecosystem.	Excavation of Riggs Brook sediments may be difficult due to access problems. A disposal site must be identified that will accept the sediments. Would be a "clean closure"; therefore, the 5-year re-evaluation program would not be required.		Achieves all ARARs.

[1] Total Cost (Present Worth)

[2] This category subsumes the three distinct categories of overall protection of human health and the environment, long-term effectiveness and permanence, and short-term effectiveness.

[3] Presentations of these two criteria are provided in Appendix A (Responsiveness Summary) and discussed in Section X of this ROD.

and the environment, and would not comply with ARARs. This alternative does not use treatment as a principal element, and consequently, there would be no reduction in the toxicity, mobility or volume of contaminants on the Site. Additionally, since no treatment is employed, this alternative would not be a permanent remedy that would provide long-term effectiveness or permanence and, therefore, would require five-year reviews as mandated by statute. Furthermore, the long-term adequacy and reliability of institutional controls is uncertain. This alternative would not be effective in the short-term since no remedial action would be undertaken at the Site, and the existing impacts to the environment would continue to be of concern. Finally, the implementability of this alternative would not be difficult since the technical feasibility and availability of services required are not specialized.

ESTIMATED TIME FOR CONSTRUCTION:	0.5 to 1 year
ESTIMATED TIME FOR OPERATION:	30 years
ESTIMATED CAPITAL COST:	$ 5,000
ESTIMATED O & M (PRESENT WORTH):	$ 913,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 918,000

SC-2
Site Capping

This source control alternative would involve draining and treating (at an off-site facility) the contaminated surface waters in the lagoons and upland marsh (each considered wetlands), and consolidation/relocation of contaminated soils, sediments and debris from remote locations on-site prior to placement of these materials under an impermeable cap. The implementation of this alternative would require the creation of a new surface water drainage system for the upland marsh, and re-routing surface waters around the area to be capped. Additionally, the on-site barn would be cleaned to levels based upon acceptable wipe test procedures and then demolished due to its deteriorated condition. The demolition material from the barn would be disposed of appropriately off-site based on the results of the wipe tests.

The relocation/consolidation of contaminated materials in remote areas of the Site would involve the clearing of vegetation and the placement of erosion control measures (i.e., siltation fences) prior to any excavation of contaminated materials. Confirmatory sampling of soils and sediments would also occur in these areas to ensure that the established target cleanup levels have been achieved prior to the backfilling of these areas.

Finally, the cap would consist of approximately two feet of clay, which would be overlain by a synthetic liner, a 12-inch layer of sand, filter fabrics, and a two-foot vegetative soil layer. The cap would extend over an area of approximately one and one-half acres that would contain the on-site contaminated soils and sediments. In addition, monitoring of the surface waters and a review of Site conditions would occur every five years as long as hazardous wastes remained on the Site above acceptable levels.

The purpose of the cap would be to significantly reduce the potential for direct contact with the contaminated materials on the Site, and to prevent the further migration (spread) of these contaminants by reducing the amount of precipitation that could filter through and away from the Site. However, since no treatment of the contaminated materials on the Site (other than the off-site treatment of surface waters) would be employed under this alternative, no reduction in the toxicity, mobility or volume of these soil and sediment contaminants would be achieved. This alternative would comply with ARARs through implementation of the appropriate closure and post-closure requirements of RCRA Subpart G, 40 CFR 264 and by ensuring that any wetlands and/or floodplain damages which are unavoidable would be mitigated and compensated for through the establishment of new, compensatory wetlands and minimization of floodplain storage capacity loss. Furthermore, although this alternative involves limited excavation and placement of hazardous substances, the existing information suggests that the substances addressed by this alternative are not RCRA-regulated waste; therefore, the RCRA Land Disposal Restrictions (LDR) are not applicable requirements. Until EPA completes the LDR rulemaking for soil and debris, the CERCLA program will not consider LDRs to be relevant and appropriate to soil and debris that do not contain RCRA-regulated wastes. This alternative uses readily available technologies and services and, therefore, is easily implemented. However, the permanence of capping is uncertain (in fact, capping is not considered a permanent remedy) since the cap would only contain and not treat the contamination. This degree of uncertainty would require long-term monitoring and maintenance (which would include five-year re-evaluations of the Site), the potential for additional replacement costs should the cap leak or fail, a restriction on the future use of the land through appropriate institutional controls, and the establishment of compensatory wetlands on-site. Finally, the short-term effectiveness of this alternative would involve some potential impacts to the surrounding area through increased truck traffic and potential dust generation, but would involve significant detrimental impacts to the environment through draining and capping of the on-site wetlands.

ESTIMATED TIME FOR CONSTRUCTION: 1 to 2 years
ESTIMATED TIME FOR OPERATION: 30 years

ESTIMATED CAPITAL COST:	$ 1,449,000
ESTIMATED O & M (PRESENT WORTH):	$ 571,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 2,020,000

SC-3
On-Site Disposal Facility

The initial steps of this source control alternative would involve draining the surface waters in the lagoons and upland marsh (each considered wetlands) and treating the contaminated water off-site, re-routing drainage patterns around contaminated areas of the Site, and decontamination and demolition of the barn, as described in SC-2 above.

Excavation of all contaminated on-site soils and sediments which exceed the site-specific cleanup goals would also be performed under this alternative. An approximately two-acre RCRA/TSCA landfill would then be constructed on the Site to dispose of these contaminated soils and sediments. The excavated areas would then be filled with clean soil, regraded, and revegetated in order to return these areas to their original condition. A leachate collection system and leak detection system installed with the landfill would be monitored periodically, and leachate generated from the landfill would eventually be transported to an off-site treatment facility. Additionally, the surface waters on the Site would be monitored, and a review of the Site conditions would occur every five years for as long as hazardous wastes remain on the Site.

Overall, since this alternative involves the excavation and placement of hazardous substances and a portion of these substances may be RCRA-regulated waste, the RCRA land disposal restrictions may be applicable requirements. Therefore, in order for this alternative to comply with ARARs, the appropriate RCRA treatment variances (if required) under LDR and/or the TSCA chemical waste landfill waivers must be obtained, along with the compensatory wetlands/floodplain issues being adequately addressed. Treatment of the on-site surface waters will result in a significant reduction in the toxicity, mobility and volume (TMV) of this contaminated media; whereas, no reduction in the TMV would be gained through simply disposing of the contaminated soils and sediments in the landfill. Furthermore, disposal without the prior use of permanent and/or alternative treatment technologies to the maximum extent practicable does not satisfy the preference stated in CERCLA. This is especially significant in comparison to many of the other source control alternatives which employ various treatment schemes. The long-term effectiveness and permanence of this alternative is uncertain especially if the landfill were to leak or fail in some way, or if the leachate collection system were to be impaired. The effectiveness of this alternative over the short-term would involve some impacts to the surrounding area during all facets of the excavation activities involved, including dust generation and increased truck traffic, but which are comparable with all other alternatives that involve extensive excavation. Finally, although some specialized services would be required to implement this alternative (especially construction of the landfill), the overall implementability of this alternative is not of concern.

ESTIMATED TIME FOR CONSTRUCTION:	1-2 YEARS
ESTIMATED TIME FOR OPERATION:	30 YEARS
ESTIMATED CAPITAL COST:	$ 3,930,000
ESTIMATED O & M (PRESENT WORTH):	$ 442,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 4,372,000

SC-4
Off-Site Disposal at a TSCA Landfill

This SC remedial alternative involves draining the surface water in the lagoons and upland marsh (each considered wetlands) and treating the water off-site, rerouting drainage patterns around contaminated areas of the Site, and decontamination and demolition of the barn, as described under SC-2. Thereafter, those contaminated soils and sediments exceeding the site-specific target cleanup levels would be excavated and disposed of at TSCA-approved, off-site chemical waste landfill. The excavated areas would then be filled with clean soil, regraded, and revegetated.

This alternative provides for overall protection of human health and the environment at the Site, while also providing a significant reduction in the toxicity, mobility and volume of the surface water contaminants found on the Site through treatment. However, no reduction in the TMV of the contaminated soils or sediments would be realized since treatment is not employed to the maximum extent practicable prior to disposal. The long-term benefits of this alternative are greater than the on-site disposal option since all contaminated materials are removed from the Site; however, the long-term uncertainties of landfilling (even at an off-site facility) significantly limit these benefits. Furthermore, landfilling is not considered a permanent remedy. The overall implementability of this alternative is comparable to all other alternatives evaluated in detail which involve excavation and/or off-site transport of contaminants; however, the availability of TSCA landfill capacity may be a problem. The effectiveness of this alternative over the short-term is similar to all alternatives which involve excavation and truck traffic activities. Finally, while this alternative provides overall protectiveness to human health and the environment, this alternative will comply with ARARs through; (a) disposal at a TSCA-permitted facility, (b) obtaining a RCRA treatment variance (if necessary) since the excavation and placement of hazardous substances from the Site may be RCRA-regulated under the applicable Land Disposal Restriction (LDR) rulemaking, and (c) providing for compensatory wetlands and minimal floodplain impacts.

ESTIMATED TIME FOR CONSTRUCTION:	1-2 YEARS
ESTIMATED TIME FOR OPERATION:	1 YEAR
ESTIMATED CAPITAL COST:	$ 14,739,000
ESTIMATED O & M (PRESENT WORTH):	$ 43,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 14,782,000

SC-5
On-Site Incineration

Under this source control alternative, as in SC-2 through SC-4, the initial steps involve draining the contaminated surface waters from the lagoons and upland marsh (each considered a wetland) and treating the water off-site, rerouting drainage patterns around contaminated areas of the Site, and decontamination and demolition of the barn. Subsequently, the soil and sediment contamination on the Site would be addressed by excavating those contaminated materials above the established target cleanup levels, and then burning these materials in a mobile, thermal destruction unit that would be set up on the Site. Additionally, off-site disposal of the lead-contaminated soils with or without prior treatment would be included in this alternative.

Prior to implementation of a full-scale thermal destruction unit on-site, a test burn and/or pilot test will be conducted at the Site to demonstrate the effectiveness of the unit in providing for the 99.9999 % destruction and removal efficiency required under TSCA, 40 CFR Part 761.70(b), and to determine whether the residues from the destruction process are nonhazardous or remain hazardous. These tests would also focus on ensuring that ambient air quality standards are not being exceeded through the use of appropriate air pollution control devices; particularly for lead.

Following the above-mentioned tests, full-scale thermal treatment of the excavated materials would proceed on the Site. Solid residues resulting from the thermal treatment unit would be analyzed to verify attainment of all target cleanup goals for the Site and the EP toxicity or TCLP characteristics of this material. Treatment residues which meet all cleanup goals and pass the characteristics tests would be redeposited back into the excavated areas; whereas, soils/sediments which do not achieve the site-specific cleanup goals would be disposed of at an approved, off-site facility with or without prior treatment for the lead-characteristic hazardous waste.

Overall, this SC alternative uses various treatment technologies to permanently reduce the toxicity, mobility and volume of the principal threats to the contaminated surface waters, soils and sediments on the Site (as preferred by CERCLA), while also providing overall protection of the human health and the environment. In addition, the demonstrated use of thermal destruction in treating PCB-contaminated (organic) materials provides a greater degree of long-term effectiveness and permanence in comparison to several of the other treatment alternatives evaluated. However, the limited availability of mobile thermal destruction units raises concerns about the implementability of this alternative. More importantly, the potential short-term impacts due to the difficulty in controlling air emissions associated with incineration (which could potentially contain lead) are major drawbacks of this alternative. Finally, since this alternative involves the excavation and placement of hazardous substances, a portion of these substances and/or treatment residuals may be RCRA-regulated waste; therefore, the RCRA land disposal restrictions may be applicable requirements. Hence, in order for this alternative to comply with ARARs (in addition to TSCA), the appropriate RCRA treatment variances under LDR for a portion of the potentially RCRA-characteristic treatment residues must be obtained, if necessary, and the compensatory wetlands/floodplain impacts must be addressed.

ESTIMATED TIME FOR CONSTRUCTION:	1-2 YEARS
ESTIMATED TIME FOR OPERATION:	1-2 YEARS
ESTIMATED CAPITAL COST:	$ 19,509,000
ESTIMATED O & M (PRESENT WORTH):	$ 203,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 19,712,000

SC-6
On-Site Solidification

As described in the previous SC alternatives, the first step in this alternative includes draining the on-site surface waters in the lagoons and upland marsh (each considered a wetland) and treating the contaminated water off-site, rerouting drainage patterns around contaminated areas, and decontamination and demolition of the on-site barn. Thereafter, approximately 23,500 cubic yards of contaminated soils and sediments above EPA's target cleanup goals for the Site would be excavated and treated on-site using a technology which involves solidification/stabilization.

The solidification/stabilization technology would essentially involve batch-mixing the excavated PCB-, cPAH-, and lead-contaminated materials on the surface of the Site with the required solidifying/stabilizing additives (such as cement or lime) in order to bind the contaminants within a solid mass or block. These blocks of treated materials would then be redeposited into the previously excavated areas on the Site, and then covered with a one-half to one foot layer of sand and one-foot of topsoil for seeding to establish a vegetative cover.

This alternative would require that laboratory/pilot-scale treatability studies be conducted both on- and off-site to further demonstrate the potential applicability of this innovative technology to conditions at the Site. In addition, this alternative would require, at a minimum, the continued upkeep of the existing fences and warning signs, and more likely the establishment of institutional controls (deed restrictions) on the Site-property over the long-term. Additionally, since hazardous substances will remain at the Site under this alternative, a review of Site conditions every five years would occur, as required by CERCLA.

In summary, this alternative eliminates the potential human health and environmental risks associated with exposures to the contaminated on-site surface waters through treatment, and would effectively prevent both human health and environmental exposures via direct contact, ingestion and/or inhalation of vapors from the contaminated on-site soils and sediments through treatment and isolation. However, the solidification component of this SC alternative would require a determination by EPA that this alternative method provides a level of performance equivalent to incineration or is consistent with a chemical waste landfill under the TSCA applicable requirements at 40 CFR part 761.60. Additionally, since this alternative involves the excavation and placement of hazardous substances and a portion of these hazardous substances are RCRA-regulated, characteristic wastes, the RCRA Land Disposal Restrictions (LDR) may also be applicable requirements; therefore, the approval of a RCRA treatability variance will be required in the event that any solidified material continues to exhibit RCRA characteristics. The short-term impacts associated with this alternative are similar (but controllable) to those involved with all other alternatives which require significant excavation activities. There are, however, differences between this SC alternative and all other SC alternatives evaluated relative to the long-term effectiveness and permanence, and the reduction in the toxicity, mobility and volume criteria considered. More specifically, the uncertainty associated with the long-term effectiveness and permanence of this alternative is unclear based upon the treatability test results obtained for this Site. These test results indicated that PCBs may not have been successfully stabilized and that only a 50% to 75% reduction in the leachability of PCBs was achieved. In addition, the reduction in the mobility and volume of contaminants (especially, the PCBs and cPAHs) may not be as significant as several other SC alternatives considered. For example, volume increases of from 5% (based on the site-specific tests) to 100% (based on the SITE programs demonstration data-see Administrative Record) have been reported using this technology. Finally, this alternative uses treatment technologies to the maximum extent practicable (as preferred by CERCLA) and would be relatively easy to implement, but the availability of the appropriate solidifying/stabilizing agents for the Site may be limited, as well as being proprietary.

ESTIMATED TIME FOR CONSTRUCTION:	1-2 YEARS
ESTIMATED TIME FOR OPERATION:	1 YEAR
ESTIMATED CAPITAL COST:	$ 4,058,000
ESTIMATED O & M (PRESENT WORTH):	$ 193,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 4,251,000

SC-7
On-Site Vitrification

This alternative includes the excavation and on-site vitrification of all contaminated on-site soils and sediments exceeding the target cleanup goals for the Site, the draining and treating (off-site) of contaminated surface waters on the Site, the rerouting of existing drainage patterns around the contaminated portions of the Site, and the decontamination and demolition of the barn.

The vitrification process would involve raising the temperature of the excavated materials to roughly 3,000 degrees Fahrenheit, and then cooling this material until it forms a solid, inert, glass-like mass. The process would involve several mobile, batch-type units into which the excavated materials would be fed, heated, and then cooled. The process destroys and/or volatilizes the organic contaminants in the material processed, and binds or fuses the inorganics within the glass-like mass. The treated mass would ultimately be broken into smaller pieces, placed into the previously excavated areas, and then covered with approximately 6-inches to one-foot of sand and one-foot of topsoil to establish a newly seeded, vegetative cover.

This alternative would also require that laboratory/pilot-scale treatability studies be conducted to demonstrate the potential applicability of this technology to the conditions found at the

Site. In addition, this alternative would require, at a minimum, the continued upkeep of the existing fences and warning signs, and more likely the establishment of institutional controls (deed restrictions) on the Site-property. Additionally, since hazardous substances will remain at the Site under this alternative, a review of Site conditions every five years would occur, as required by CERCLA.

This alternative would be protective of the human health and the environment (with the appropriate management controls in-place). This alternative would also meet ARARs when; (1) a determination by EPA is made that this alternative method of treatment provides an equivalent level of performance to incineration or is consistent with a chemical waste landfill under TSCA, (2) since the excavation and placement of hazardous substances may involve RCRA-regulated, characteristic wastes, a RCRA treatability variance may be required in the event that the treated material continues to exhibit RCRA characteristics, and (3) the compensatory wetlands and potential floodplain impacts are adequately addressed. This alternative would result in a significant reduction in the toxicity, mobility and, especially, volume of organic contaminants in the contaminated media at the Site. However, this treatment technology (as preferred by CERCLA), has only been demonstrated in the treatment of PCB-contaminated materials on limited occasions and only during small-scale laboratory tests. Therefore, the long-term effectiveness and permanence uncertainties would require further study and, at a minimum, a five-year review of Site conditions into the future. Additionally, the potential short-term impacts that could result from the volatilization of the contaminated materials during implementation of this technology at the Site are unknown. Finally, the implementability of this alternative is apparently limited due to the fact that full-scale, commercially available units are still under development, and may not be immediately accessible.

ESTIMATED TIME FOR CONSTRUCTION:	1-2 YEARS
ESTIMATED TIME FOR OPERATION:	1-2 YEARS
ESTIMATED CAPITAL COST:	$ 19,609,000
ESTIMATED O & M (PRESENT WORTH):	$ 203,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 19,812,000

SC-10

On-Site Alkali Metal Dechlorination

This SC alternative is very similar to SC-7, except that the excavated soils and sediments exceeding the site-specific target cleanup goals would be mixed with a combination of chemicals forming a reagent, called APEG, that is capable of detoxifying

PCBs through the removal of chlorine atoms from the PCB molecule structure. The mixture is allowed to react in a batch-type, steam-jacketed vessel which provides heat to enhance the reaction. Water and organic vapors generated from the reaction are captured and treated. The resulting solid residues from the vessel are then separated from the reagent through a series of washings. The washed, dechlorinated solid residues would then be placed back on the Site (assuming the target cleanup goals are achieved), and the contaminated reagent would be disposed of at an off-site treatment facility.

Prior to full-scale implementation of the dechlorination process, laboratory and pilot-scale treatability studies would be performed to evaluate the effectiveness of the process on the contaminated materials specific to the Site. This testing would be conducted to adjust the conditions necessary for the treatment process to achieve the required cleanup levels for the Site, and to determine whether the treatment residues would require additional treatment (especially, for the cPAHs and lead). A five-year review of the Site conditions would also likely be implemented as a part of this alternative to evaluate the continuing performance of this technology.

This alternative would be protective and also meet ARARs once the three (3) conditions as stated in SC-7 are satisfied. The dechlorination component of this SC alternative would significantly reduce the toxicity, mobility and volume of the PCB contamination in the soils and sediments undergoing treatment. Additionally, this alternative incorporates permanent and alternative treatment technologies into the remedial action process, as preferred by CERCLA. However, other than during small-scale laboratory and pilot-scale tests, the degree of certainty attained by the dechlorination technology over the long-term is unclear at present (especially regarding the treatment potential of the cPAHs and lead on the Site). This technology has also shown significant variability in achieving low PCB target cleanup levels through these tests, and could potentially leave minor amounts of APEG and/or biphenyl residuals in the treated soils. Finally, the limited availability of full-scale treatment units is also a concern that needs to be considered.

ESTIMATED TIME FOR CONSTRUCTION:	1-2 YEARS
ESTIMATED TIME FOR OPERATION:	1-2 YEARS
ESTIMATED CAPITAL COST:	$ 9,694,000
ESTIMATED O & M (PRESENT WORTH):	$ 203,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 9,897,000

SC-11A
On-Site Solvent Extraction and Disposal of Treated Soils

This SC alternative has been selected as the remedial alternative component of the overall selected remedy for addressing the soil, sediment and surface water contamination at the Site. This SC alternative is described in considerable detail within Section X, The Selected Remedy, of this ROD.

SC-11B
On-Site Solvent Extraction and Off-Site Disposal of Lead-Contaminated Soils

This source control alternative is very similar to the selected remedy in that on-site solvent extraction is the major component for treatment of the contaminated soils and sediments on the Site, and on-site surface water drainage/off-site treatment and barn decontamination/demolition are also components of this SC alternative. However, the target cleanup levels for both the PCBs and cPAHs in the soils and sediments on the Site would be 10 ppm, respectively, while the lead cleanup level would remain at 248 ppm. This increase in the PCB/cPAH soil and sediment cleanup levels was proposed by the potentially responsible parties (PRPs) for the Site (specifically, Central Maine Power-CMP), and would result in a lower estimated volume of contaminated materials requiring excavation (i.e., only approximately 9,000 cubic yards as compared with the 23,500 cubic yards estimated for all other alternatives described above).

Additionally, this alternative would include covering, with approximately 10-inches of clean soil: (1) those soils and sediments which are not excavated and still contain greater than 1 ppm but less than 10 ppm PCBs and/or cPAHs, and (2) those soils and sediments that are excavated and undergo solvent extraction but still exceed 1 ppm PCBs/cPAHs. In addition, all soils containing greater than 248 ppm lead (approximately 400 cubic yards) would be excavated and disposed of at an approved, off-site disposal facility, following solidification/stabilization, if necessary, to meet the RCRA Land Disposal Restrictions (LDR) which would be applicable to any treated soils and sediments which exhibit RCRA characteristics.

As with the alternative SC-11A, prior to full-scale implementation of the solvent extraction process, laboratory and/or pilot-scale treatability tests would be conducted to establish the operating conditions for the effective extraction of the site-specific contaminants. Full-scale operation would then proceed after these tests have determined the optimum treatment scheme to be implemented at the Site.

The capacity of this source control alternative to satisfy the requirement of overall protection of human health and the environment would depend upon the effective, long-term maintenance of the 10-inch clean soil fill which would cover those contaminated materials that still exceed the 1 ppm PCBs and/or cPAHs site-specific cleanup goals. This would, at a minimum, require the establishment of institutional controls for restricting future use of the Site, and the continued maintenance of the existing nine-acre fence and appropriate warning signs in perpetuity. The reliability of such institutional controls is questionable at best. This alternative would comply with ARARs once the three (3) conditions stated above under alternative SC-7 are satisfied. Some reduction in the toxicity, mobility and volume of the contaminants on the Site would occur. However, the magnitude of these reductions would not be significant. Additionally, as noted in connection with the protectiveness criterion above, due to the need for a 10-inch soil cover as a major component of this alternative, the long-term permanence of this alternative is uncertain because of potential disturbances (including burrowing animals) of this soil layer. Finally, this alternative is easily implementable, and employs treatment but not to the same extent as provided by the selected remedy.

ESTIMATED TIME FOR CONSTRUCTION:	1-2 YEARS
ESTIMATED TIME FOR OPERATION:	1-2 YEARS
ESTIMATED CAPITAL COST:	$ 5,679,000
ESTIMATED O & M (PRESENT WORTH):	$ 203,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 5,882,000

B. Management of Migration (MM) Alternatives Analyzed

Management of migration alternatives address contaminants that have migrated from the original source of contamination. At the O'Connor Co. Site, contaminants have migrated from the contaminated soils/sediments on the Site into the groundwater beneath the Site and into sediments within Riggs Brook located off-site. The management of migration alternatives evaluated for the Site to address the contaminated groundwater included a minimal no-action with monitoring alternative (MM-1), and an extraction and treatment alternative (MM-3). The management of migration alternatives evaluated in detail to address the sediment contamination within Riggs Brook included a minimal no-action with monitoring alternative (SE-1), and an excavation and disposal alternative (SE-2). Each of these alternatives are described in detail below.

1. Groundwater

MM-1
Minimal No Action with Monitoring Alternative

This alternative includes the establishment of educational programs within the community to inform the public of the progress and results from sampling of the on-site groundwater. Additionally, institutional controls to limit the future use of the contaminated groundwater would be established in the form of deed restrictions. Furthermore, since groundwater contaminants exceeding health-based levels and ARARs remain on the Site under this alternative, the statutory requirements for five year reviews of the Site would occur.

This alternative would be protective of human health and the environment upon establishment of the institutional controls for restricting the use of the groundwater over the long-term. However, since the contaminated groundwater exceeds both the federal MCLs and state MEGs (both considered ARARs for this Site), this alternative would not be in compliance. The long-term effectiveness of institutional controls are also a major concern under this alternative. No reduction in the toxicity, mobility or volume of the contaminants in the groundwater would be achieved by this alternative since no treatment is employed. Finally, no implementability problems or short-term impacts would be associated with this alternative since very limited action would occur at the Site.

ESTIMATED TIME FOR CONSTRUCTION: 0 years
ESTIMATED TIME FOR OPERATION: 30 years

ESTIMATED CAPITAL COST:	None
ESTIMATED O & M (PRESENT WORTH):	$ 674,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 674,000

MM-3
Groundwater Extraction and On-Site Treatment

This MM alternative has been selected as the remedial alternative component of the overall selected remedy for addressing the groundwater contamination at the Site. This MM alternative is described in considerable detail within Section X, The Selected Remedy, of this ROD.

2. Riggs Brook Sediment

SE-1
Minimal No-Action

This SE alternative has been selected as the remedial alternative component of the overall selected remedy for addressing the sediment contamination within Riggs Brook. This SE alternative is described in considerable detail within Section X, The Selected Remedy, of this ROD.

SE-2
Excavation and Off-Site Disposal of Contaminated Sediments

This alternative would include the removal of an estimated 900 cubic yards of PCB-contaminated sediments which exceed the 1 ppm target cleanup level established for sediments within Riggs Brook. This volume of sediments is primarily located within the 400 feet of brook from Route 17 to the point where no detectable levels of PCBs were found during the RI, and within the full width of approximately 60 feet of the affected stream channel. Excavation activities would be attempted during ideal conditions, if possible, when stream flow is minimal. However, in order to establish a firm base for the excavation equipment, the brook may be diverted away from the contaminated areas to allow easier access to the sediments. Once the excavation activities have been completed and verified through sampling, the PCB-contaminated sediments (currently containing no greater than 5 ppm) would be disposed of in a solid waste landfill, if acceptable. Finally, the brook and associated wetlands which were destroyed during the excavation activities would be restored. This would be conducted in close coordination with federal and state agencies who are responsible for these natural resource areas.

This alternative would be protective of human health and the environment and would comply with ARARS. However, the existing levels of PCB-contamination within Riggs Brook do not represent a risk to humans which is outside the 10-4 to 10-7 risk range or that exceeds the FDA action limit of 2 ppm for the protection of human health, and the PCB levels within the environment (biota) is very close to the levels found in background samples. The long-term effectiveness and permanence of this alternative could produce irreversible damages to this ecosystem. Additionally, no reduction in the toxicity, mobility or volume of the contaminants would be gained by this alternative since no treatment is employed. Furthermore, the short-term effects and difficulties in implementing this type of excavation alternative are major obstacles that would have to be addressed.

ESTIMATED TIME FOR CONSTRUCTION:	1 year
ESTIMATED TIME FOR OPERATION:	1 year
ESTIMATED CAPITAL COST:	$ 291,000
ESTIMATED O & M (PRESENT WORTH):	$ 291,000
ESTIMATED TOTAL COST (PRESENT WORTH):	$ 291,000

X. THE SELECTED REMEDY

The selected remedial action for the O'Connor Co. site ("the Site") is a comprehensive, multi-component approach for overall remediation of the soil, sediment, surface water, and groundwater contamination at the Site. This comprehensive approach is described in detail below together with the rationale used for the selection of this remedial action.

A. Description of the Selected Remedy

1. Remedial Action Objectives/Cleanup Goals

The selected remedy was developed to provide overall protection of human health and the environment. This remedy was also developed to satisfy the remedial action objectives established for the Site, as discussed in Section VIII above, and to comply with all requirements of CERCLA that were identified for the Site, as discussed in detail in Section XI. The selected remedy, as described herein, will be used to guide the design and to measure the success of the remedy.

a. Soil

In the Endangerment Assessment (EA), the exposures from the contaminated on-site soils which were evaluated and determined to be of primary concern for the protection of human health were those which involved children potentially trespassing onto the Site under current conditions, and future inhabitants living on-site. Additionally, exposures from the contaminated on-site soils were also evaluated and determined to be a primary concern for the protection of the environment, particularly migratory birds whose diets are comprised of soil-dwelling organisms or consumers of soil-dwelling organisms obtained from the Site.

Based upon these site-specific findings, the soil cleanup goals of 1 ppm PCBs, 1 ppm cPAHs and 248 ppm lead were established in order to provide overall protection of human health and the environment.

In developing these soil target cleanup goals, EPA initially evaluated the information provided in the site-specific endangerment assessment, and current Federal statutes, regulations, criteria, directives, advisories, guidances and policies. The results of this preliminary formulation of remediation goals for the protection of human health indicated, that for a cumulative, lifetime (70-year) excess cancer risk of 1 X 10-5 (one in one hundred-thousand) according to the reasonable maximum exposure scenario for the Site of potential future, residential-use, that the corresponding cleanup level should be approximately 3-4 ppm PCBs, and 1 ppm cPAHs (see Appendix B-1f of the Feasibility Study). Furthermore, the target cleanup level for lead-contaminated soils, based upon protection of human health from future-use exposures such that no appreciable risk of significant adverse health effects over a lifetime of exposure exists, resulted in a cleanup level of 248 ppm.

EPA then evaluated these preliminary soil target cleanup levels in relation to the remedial response objectives which addressed reducing the potential environmental risks associated with exposures to the contaminated soils. Based upon the results of the Wetlands/Ecological Assessment that was performed as part of the Endangerment Assessment for the Site, the existing concentrations of PCB-contaminated soils on the Site were found to potentially pose a significant hazard to soil-dwelling and burrowing animals, to migratory birds and other terrestrial wildlife, and to aquatic wildlife. This baseline information, together with a detailed evaluation by the U.S. Fish & Wildlife Service (F&WS) of the available literature on the effect levels to wildlife from PCBs in soils, determined that reproductive effects and, in some cases, mortality occurs from exposures to PCBs in the range of 0.1-10 ppm. Consequently, upon further consultation from the F&WS, a soil target cleanup level of 1 ppm PCBs was selected for the Site for the protection of the environment. Several letters, and a memorandum, prepared by the F&WS which discuss the effect levels to wildlife from PCBs in support of the 1 ppm soil target cleanup level are attached as Appendix B to this ROD.

Additionally, based upon a separate assessment of the human health risks posed by the Site as performed by State of Maine's Department of Human Services-DHS, the PCB soil target cleanup level for the protection of human health was determined to be no greater than 1 ppm anywhere on the Site. Variations in the reasonable worst-case exposure assumptions used by the DHS, in comparison to EPA's quantitative risk assessment, were the underlying reasons for the differences in the PCB soil cleanup level for the protection of human health. The State of Maine's position and technical basis for their PCB soil target cleanup level is set forth in a letter (with attachment) as provided in Appendix C of this ROD. Therefore, the State of Maine requested that a more stringent target cleanup level for PCBs of 1 ppm be established for this Site to be protective of human health. The State of Maine noted that this soil cleanup level was also consistent with the F&WS target cleanup level for the protection of terrestrial wildlife, and would satisfy existing State of Maine policy and gain the State's acceptance on the selected remedy. The cPAH and lead cleanup goals of 1 ppm and 248 ppm, respectively were determined by the DHS to be acceptable for the protection of human health.

Finally, because the source of the current and future human health risks estimated from the inhalation of PCB vapors from the Site were the contaminated surface soils themselves, the objective of reducing the risks associated with these vapors is addressed by the 1 ppm target cleanup goal for PCBs found anywhere on the Site.

b. Ground Water

The response objective established for the contaminated on-site groundwater was based upon the potential future consumption of the water for drinking water purposes. Despite the limited potential for off-site migration of the contaminated groundwater and use of the groundwater for drinking water purposes, the potential for future human health risks was considered together with the State's classification of the groundwater as being suitable for drinking water purposes and the current exceedance of the groundwater above Federal and/or state drinking water standards.

EPA, in turn, set groundwater target cleanup goals for the Site based on the Federally established "maximum contaminant levels" (MCLs) and the State of Maine's "maximum exposure guidelines" (MEGs) which were determined to be ARARs for the Site. The contaminants of concern for the on-site groundwater and their respective cleanup goals are: PCBs (0.5 ppb); 1,4-dichlorobenzene (27 ppb); and benzene (5 ppb).

c. Surface Water

Based upon the assessment, as provided in the EA, of the potential risks from exposures to wildlife with the contaminated surface waters on the Site, a remedial action objective was established to reduce these potential environmental risks. (Note that no significant risk to human health was identified in the EA from direct exposures to, excluding ingestion of, these surface waters).

Target cleanup goals were, therefore developed for the PCB-, lead-, and aluminum-contaminated surface waters within the upland marsh, and upper and lower lagoons. These goals were established to be consistent with EPA's Ambient Water Quality Criteria (AWQC), to the maximum extent possible, as to be considered criteria for this Site. These target cleanup goals are: PCBs (0.065 ppb); lead (1.94 ppb); and aluminum (87 ppb).

In the case of PCBs, the AWQC of 0.014 ppb (as a 24-hour average) is not analytically achievable, while available data indicates that acute toxic effects to freshwater aquatic life will more likely occur at concentrations above 2 ppb based on a 24-hour average. Furthermore, in considering human health impacts from these contaminated surface waters, the AWQC for protection of human health through ingestion of contaminated water and aquatic organisms is 0.079 ppb at an incremental increase of cancer risk over a lifetime of exposure of 1 X 10-6 (1 in 1,000,000). Therefore, the PCB target cleanup goal for surface waters at the Site was based on the lowest, existing detection limit technically achievable by current laboratory analytical equipment and techniques. This target cleanup goal of 0.065 ppb PCBs is considered protective of human health and the environment.

Achievement of the above described target cleanup goals will be further ensured through the off-site treatment of all contaminated surface waters located within the upper and lower lagoons, and the upland marsh.

d. Sediments

In establishing the reasonable maximum exposure scenario for future direct contact with the contaminated sediments located on the Site, the EA considered the risks associated with children who would play in these areas without any restrictions on access (i.e., future , residential-use exposures). Additionally, the U.S. F&WS performed an evaluation of the environmental risks posed by these same PCB-contaminated sediments (see Appendix B of this ROD). The assumptions used to quantify the potential human health and environmental risks associated with exposures from these PCB-contaminated sediments were generally similar to those described previously in a. above. Therefore, the target cleanup levels established for the protection of human health and the environment were the same as those established for the on-site soils, i.e., 1 ppm PCBs, 1 ppm cPAHs and 248 ppm lead.

The contaminated sediments located within Riggs Brook (maximum concentration of PCBs, the key contaminant of concern, was 5 ppm) were separately evaluated to address the remedial objectives of reducing potential present and future environmental risks to aquatic biota within Riggs Brook, and to reduce potential present and future human health risks from ingestion of PCB-contaminated fish obtained from Riggs Brook. Based upon the information discussed above relative to the U.S. Fish & Wildlife Services evaluations applicable to this Site (see Appendix B of this ROD), and the recommended range of PCB sediment levels proposed in a document prepared by the National Oceanic and Atmospheric Administration (NOAA-see Administrative Record), the target cleanup level established for the PCB-contaminated sediments within Riggs Brook was 1 ppm.

2. Description of Remedial Components

The selected remedy for the Site includes a combination of remedial alternatives SC-11A, MM-3 and SE-1, as noted previously in Section IX. The major remedial components of the selected remedy include:

A. Source Control (SC)

1. Draining and off-site treatment of on-site surface waters in the upland marsh and lagoons.

2. Re-routing of the existing surface water drainage patterns.

3. Decontamination/demolition of the barn.

4. Clearing of vegetation, installation of erosion control measures, and excavation of contaminated soils and sediments.

5. On-site treatment of contaminated soils and lagoon/marsh sediments using a solvent extraction technology.

6. On-site treatment of contaminated soil and sediment residue failing the Extraction Procedure (EP) Toxicity test or the Toxicity Characteristic Leaching Procedure (TCLP) using a solidification/stabilization technology.

7. Transportation and off-site disposal at a licensed RCRA/TSCA landfill of solidified/stabilized soil and sediment residue, and soil and sediment residue that does not achieve all target cleanup levels following solvent extraction.

8. Site restoration.

9. Establishing compensatory wetlands/waters of the United States.

10. Five-year review of site conditions, as appropriate.

B. Management of Migration

1. Groundwater (MM):

a. Establishment of temporary institutional controls until groundwater remediation goals are achieved.

b. Installation of groundwater extraction and monitoring well(s).

c. On-site groundwater treatment system and recharge system installation.

d. Treatment system and recharge system monitoring, and operation and maintenance.

e. Five-year review of site conditions.

2. Riggs Brook Sediment (SE)

a. Establishment and implementation of extensive sediment and biota sampling and analysis program within Riggs Brook.

b. Implementation of public education programs.

c. Five-year review of site conditions.

3. Implementation of Remedial Components

The following discussion presents in further detail the likely sequence of events which will occur during the implementation of each of the above-described remedial components that are included in the selected remedy.

Draining and Off-Site Treatment of On-Site Surface Waters (SC)

This component involves pumping the water from the upper and lower lagoons and the upland marsh, and transporting this contaminated water via tanker trucks to a permitted, off-site treatment/disposal facility. The volume of water to be pumped is estimated at between 150,000 and 195,000 gallons (total).

Re-routing of Existing Surface Water Drainage Patterns (SC)

The existing major drainage pattern on the Site occurs approximately down the center of the Site, through the upper and lower lagoons, and into Riggs Brook (see Figure 6-1). Secondary pathways occur along both the northeastern and southwestern fence lines towards Riggs Brook. This remedial component would involve creating a new drainage system around the perimeter of the Site that would divert surface waters away from the contaminated portions of the Site. This system would be established through the installation of a storm water drainage culvert leading from the upland marsh, through appropriate manholes, and into the existing drainage ditch along U.S. Route 17 leading towards Riggs Brook.

Decontamination/demolition of the Barn (SC)

Due to the existence of contaminated materials within and on interior portions of the on-site barn structure, the floor of the barn will be cleaned by removing all the soil, dust, and other loose material and including this with the contaminated soils and sediments undergoing excavation. Large recoverable items remaining in the barn will either be removed by the appropriate owner of the item or disposed of as solid waste in a local sanitary landfill, as found acceptable.

Once the barn is cleaned of the above-noted materials, the entire structure will undergo standard wipe test procedures to ensure that the barn is not contaminated above acceptable levels. In lieu of a site-specific determination of these acceptable levels, the procedures and action levels may be those described in the TSCA Spill Cleanup Policy at 40 CFR Part 761, Subpart G. Following decontamination of the barn, the entire structure will be demolished due to its deteriorating condition, and taken off-site for disposal as demolition debris or in accordance with the TSCA Disposal Regulations at 40 CFR Part 761, Subpart D, if applicable.

Clearing of Vegetation, Installation of Erosion Control Measures, and Excavation of Contaminated Soils and Sediments (SC)

* Erosion Control -- Siltation fences and hay bales will be used to mitigate the potential for overland transport, by precipitation-generated surface waters, of contaminated on-site soil and/or sediment particles during excavation activities. The siltation fencing will be installed downgradient of the areas undergoing excavation, i.e., between the Site and Riggs Brook (all along its northern bank near the Site). The siltation fence would be periodically inspected and cleaned in areas where materials have accumulated, and would remain in-place until vegetation is re-established over those areas disturbed by the excavation activities. Hay bales would also be used within the newly constructed drainage system discussed previously. These hay bales will also be inspected periodically and cleaned where a build-up of materials has occurred.

* Vegetation Clearing -- Tall grass, shrubs, trees, and other vegetation located above the existing grade of the Site will be cleared from those areas where contaminated soils and/or sediments (above the established target cleanup levels) will be excavated. This material would all be shredded or chipped on-site to reduce the overall volume to be handled. This material will eventually be disposed of at a solid waste landfill, if found acceptable, or treated in the same manner on-site as the

contaminated soils and sediments.

* Excavation of Contaminated Soils and Sediments -- Prior to the initiation of the excavation activities, gravel access roads would be constructed on the Site, around areas contaminated above the target cleanup levels, to provide easier access to the low-lying, eastern portions of the Site. These roads would be designed to accommodate the moderate-heavy construction equipment required to perform the excavation and treatment activities on the Site.

Following these activities, excavation of those soils and sediments contaminated in excess of EPA's site-specific target cleanup goals will commence. The volume of excavated, contaminated soils and sediments is estimated to be approximately 23,500 cubic yards. The existing analytical data provided in the RI will be used to preliminarily establish the areas and depths of the excavation. The excavation would first proceed in those areas where the on-site treatment system would be setup (possibly within the TWA III area).

To ascertain that those areas which undergo excavation achieve the target cleanup goals established for the Site, confirmatory sampling will occur throughout and along the perimeters of these areas. The sampling would be conducted to statistically determine whether an area has achieved the goals or requires further excavation. Both field screening techniques and certified laboratory confirmation analyses for PCBs, cPAHs, and lead will occur throughout the excavated areas.

Treatment of Contaminated Soils and Sediments (SC)

All of the approximately 23,500 cubic yards of contaminated soils and sediments containing PCBs, cPAHs, and lead above the established target cleanup goals will be treated on the Site using a solvent extraction technology. This technology involves the use of a solvent to extract the PCBs and cPAHs from the contaminated soils and sediments. The lead is not likely to be treated by this technology to any significant degree. However, since the lead-contaminated materials are co-located with the PCBs and cPAHs, it would be technically impracticable to separate out the lead; additionally, the treatability study results indicate that the lead may in fact bind to the treatment residue. The contaminated liquid containing the extracted PCBs and cPAHs from the soils and sediments would be eventually destroyed at a licensed, off-site TSCA incinerator.

Prior to full-scale implementation of the solvent extraction process on the Site, additional treatability studies will be performed both in the laboratory and at the Site. These additional studies will provide further information regarding the ability of this technology to achieve the 1 ppm cleanup goals for PCBs and cPAHs (especially on soils/sediments containing PCBs between 20 and 100 ppm initial concentrations), and will also assist in establishing the optimum operational settings for full-scale extraction of these contaminants at the Site.

Additionally, once full-scale on-site solvent extraction commences, any exhaust gases generated by this system will be treated by air pollution control devices. Furthermore, ambient air monitoring during the excavation and on-site treatment phases of the entire remedial action will be performed to ensure compliance with all Federal and State air quality standards, and to ensure the safety of on-site workers and the public.

Treatment of Solid Residues Exhibiting a Characteristic Hazardous Waste (SC)

As noted above, the solvent extraction technology will not likely remove (extract) the lead from the contaminated soils or sediments which are excavated above the 248 ppm target cleanup level. These solid residues will undergo further treatment using a solidification/stabilization technology if, after undergoing the EPA standard EP (extraction procedure) toxicity test or TCLP (toxicity characteristic leaching procedure), they exhibit the characteristics of a hazardous waste. If these same solid residues (still containing greater than 248 ppm lead) do not exhibit the characteristics of a hazardous waste, they will be disposed of as described below. The solidification/stabilization treatment technology essentially uses a combination of physical and chemical stabilization processes to bind and isolate contaminants within the treated mass, resulting in a substantial reduction in the mobility of the contaminants. In the case of inorganics such as lead, the metal is converted into an insoluble hydroxide and silicate which can then be physically bound to the stabilization additive.

Off-site Transport and Disposal of Treatment Solid Residues (SC)

Those solid treatment residues resulting from the solvent extraction process, that do not achieve the target cleanup goals established for the protection of human health and the environment at the Site (i.e., 1 ppm PCBs, 1 ppm cPAHs, or 248 ppm lead) and/or that have undergone additional treatment through solidification/fixation, will be transported off-site in appropriately sized containers and trucks to be disposed of at a licensed RCRA/TSCA landfill.

Based on the treatability study already performed on soils from the Site using a solvent extraction technology and the additional information available for this same technology on other PCB-contaminated materials, it is currently approximated by EPA that only 4,500 cubic yards (20 percent) of the total 23,500 cubic yards of contaminated soils and sediments undergoing solvent extraction at the Site will require off-site disposal. Further information obtained during the additional treatability studies to be performed during the design phase for the selected remedy, as noted above, will provide added evidence to modify this estimate, if necessary. Additionally, as also noted above, the lead-contaminated soils and sediments co-located on the Site with the PCBs and cPAHs will not likely be treated by the solvent extraction technology and will, therefore, undergo further treatment by solidification/fixation. This amount of contaminated material is approximated to be 500 cubic yards, based on existing data from the Site.

Overall, it is currently estimated that the volume of contaminated soils and sediments that will be transported off the Site will be approximately 5,000 cubic yards; either as solid, non-solidified residue or as solidified residue.

Site Restoration (SC)

Following implementation of the above-described remedial action source control components, the Site will be restored. This will include the backfilling of those areas of the Site where the excavation originally occurred to remove the approximately 23,500 cubic yards of contaminated soils/sediments exceeding established target cleanup levels. The backfilling of these areas will require that: (a) new native soil be brought to the Site from an off-site location which totals approximately 5,000 cubic yards, based upon present EPA estimates that this volume of soil/sediment will be transported off-site for disposal, and (b) those residual soils from the on-site solvent extraction system that achieve all the established target cleanup goals be placed back onto the Site (i.e., approximately the remaining 18,500 cubic yards). These backfilled soils will then be regraded to establish new surface water drainage patterns on the Site, and the restored areas fertilized, seeded and mulched to establish a protective vegetative cover.

Establishment of Compensatory Wetlands/Waters of the United States (SC)

The draining and off-site treatment of those contaminated surface waters and excavation of the contaminated sediments contained within the upland marsh, and upper and lower lagoons on the Site will result in the loss of these wetland areas. Given the levels of contaminated wastes within these areas and the overall goal of this remedial action, there are no practicable alternatives to the draining and excavation that will occur in these areas in order to achieve the target cleanup goals established for the soils and sediments on the Site. Therefore, the unavoidable impacts that may be caused by the destruction of these areas must be mitigated and compensated for to the maximum extent practicable. The establishment of wetland areas of equal or higher value will be recreated to the extent required by federal and state wetland ARARs, if technically feasible, within the O'Connor property. Prior to initiation of the remedial action, a further evaluation of the functional attributes of these areas will be required. Additionally, in siting and developing these compensatory wetlands following completion of the source control components of the overall selected remedy, EPA will consider potential affects on groundwater flow or adverse impacts on other aspects of the remedial action prior to their implementation. Furthermore, any potential effects on the 100-year floodplain partially located on the Site will be limited through the use of careful construction practices during the entire excavation activity to be performed on the Site.

Establishment of Temporary Institutional Control on Site Groundwater (MM)

Institutional controls, in the form of deed and land-use restrictions, will be temporarily established on the Site to restrict the use of the contaminated groundwater. This will reduce the potential for exposures by humans to the contaminated groundwater until the remediation of this water is completed.

Installation of Groundwater Extraction Well(s) (MM)

In order to achieve the groundwater remediation goals discussed previously in this section of the ROD and to intercept the sporadic concentrations of contaminated groundwater located on the Site from possibly migrating off-site, strategically located and carefully constructed extraction well(s) will be installed and pumped for subsequent treatment on-site. Based on the current information provided in the RI report, the proposed extraction well(s) would be installed at a downgradient location to TWA II and would be capable of pumping at a rate of approximately 0.5 gallons per minute. The location, number of extraction well(s), operating conditions, capture zone efficiency, etc. will be determined during the design phase through the performance of one or more pump tests at the Site.

On-site Groundwater Treatment System/Recharge System Installation (MM)

The groundwater treatment system for the extracted groundwater will include a preliminary filtration step for the removal of particulates, suspended solids and oil droplets; a granular activated carbon (GAC) unit for removal of the organics; and, an on-site system for recharge of the treated groundwater that achieves the target cleanup goals established for the Site. The primary organic contaminants of concern in the Site groundwater are benzene, 1,4-dichlorobenzene, and PCBs. If, based on the pump test mentioned above and the analytical results of the groundwater from these tests, inorganics such as iron and/or manganese are present and could cause fouling problems with the activated carbon units, then an in-line pretreatment unit for these metals would be added during the design phase of the overall treatment system. The injection/recharge system for the treated groundwater will consist of a trench or well(s) located outside and upgradient of the triangular area formed by existing on-site wells MW-101, MW-102, and MW-105.

Groundwater Treatment System Monitoring, and Operation and Maintenance (MM)

System monitoring, in the form of periodic sampling and analysis efforts, will occur at the Site to evaluate the performance and efficiency of the entire groundwater extraction and treatment system. These sampling events will involve the analysis of both the influent and effluent streams to the treatment system for both organics and inorganics. The frequency of monitoring will occur on a monthly basis (at a minimum) during the first six months of operation or until the target cleanup goals are being consistently achieved. Thereafter, the sampling and analysis frequency will likely be reduced to a quarterly basis. This anticipated monitoring schedule is expected to adequately evaluate the system, and indicate the need for replacement of the activated carbon canisters required for effective treatment.

Additional environmental monitoring of the groundwater extraction and treatment system will occur through the sampling and analysis of the on-site groundwater using existing and newly installed monitoring wells located around the Site. Specific wells to be installed and the analytical parameters to be evaluated as part of this monitoring phase will be described in the design, based upon the pumping tests and subsequent results obtained from these tests. Monitoring will occur quarterly starting from the initiation of the design work for the selected remedy, and for a period of three years after remediation activities are completed. At that time, the frequency and location of groundwater sampling will be re-evaluated. Groundwater monitoring activities will continue to be evaluated no less than every five years for at least the remainder of the 30-year monitoring program.

Establishment and Implementation of Riggs Brook Sampling and Analysis Program (SE)

Reducing the potential human health and environmental risks that may be posed by the localized areas of PCB-contaminated sediments (containing greater than 1 ppm) within Riggs Brook will require that a monitoring program be implemented. To do so, environmental sampling of the sediments from Riggs Brook and its associated nearby wetlands will be conducted once every year for ten years to ensure that the level of PCBs is not increasing and remains below 5 ppm. Fish will also be sampled approximately once, after five years of sediment monitoring. If an increase in the current PCB sediment levels occurs above the 5 ppm threshold and/or the fish tissue samples are found to be greater than 2 ppm, then a more rigorous sampling effort of such contamination will be conducted to determine the need for and/or extent of further remedial actions to be undertaken within Riggs Brook, if any.

Implement Public Education Programs (SE)

Complementing the above-described sediment monitoring program will be the establishment of public educational programs which would involve public meetings and presentations to increase public awareness about the status of contamination within Riggs Brook, and also the overall Site conditions. This would involve periodic presentations at a public hearing before all interested members of the community.

Five-Year Review of Site Conditions

Under CERCLA § 121(c), any remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site shall be reviewed no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

Since the remedial action for the Site (as presented herein) will result in hazardous substances remaining in the on-site groundwater and the sediments of Riggs Brook (at a minimum), this will require that the overall Site conditions be reviewed at least once every five years after the initiation of the remedial action at the Site (including the Site proper, as appropriate). This review will be consistent with the CERCLA standards applicable for five-year site reviews in effect at the time of the review. The extent and nature of this review program will be developed during the design phase of the selected remedy, but will include, at a minimum, those data collected during the monitoring programs identified above for the groundwater and Riggs Brook sediments.

The Site will also be re-evaluated to determine the risk posed by the Site at the completion of the remedial action (i.e., before the Site is proposed for deletion from the NPL).

B. Rationale for Selection

The rationale for choosing the selected alternative is based on an assessment of each criteria listed in the evaluation of alternatives section of this document. In accordance with Section 121 of CERCLA, to be considered as a candidate for selection in the ROD, the alternative must have been found to be protective of human health and the environment and able to attain ARARs unless a waiver is invoked. In assessing the alternatives that met these statutory requirements, EPA focused on the other evaluation criteria, including, short-term effectiveness, long-term effectiveness, implementability, use of treatment to permanently reduce the mobility, toxicity and volume, and cost. EPA also considered nontechnical factors that affect the implementability of a remedy, such as state and community acceptance. Based upon this assessment, taking into account the statutory preferences of CERCLA, EPA selected the remedial approach for the Site.

As described in detail above, the selected remedy is a comprehensive approach for overall remediation of the Site which involves both source control and management of migration remedial alternatives. In summary, this remedy has been selected because it represents the best balance among all of the "primary balancing criteria" considered, while also gaining State and community acceptance.

Source Control

The source control (SC) component of the selected remedy, which essentially involves on-site treatment of contaminated on-site soils and sediments together with off-site disposal of treatment residues, and off-site treatment of contaminated on-site surface waters, was chosen from among the other SC alternatives for several reasons. First and foremost, this component of the remedial action selected for the Site will provide overall protection of human health and the environment by eliminating, reducing and controlling all current and potential risks posed by all exposure pathways at the Site, and will be in compliance with all applicable or relevant and appropriate requirements (ARARs).

The long-term effectiveness and permanence of the selected remedy were determined to be critical factors in balancing the trade-offs among all other source control alternatives evaluated. More specifically, the magnitude of the risks remaining from the treatment residuals following successful implementation of the selected remedy will be well within EPA's acceptable cumulative risk range of 10-4 to 10-7 individual, lifetime excess cancer risk. Since no remaining sources of risk from either treated or untreated residuals would exist on the Site (due to the off-site landfilling of untreated residuals), no management (institutional) controls will be needed upon completion of this response action. By contrast, all other source control alternatives evaluated (excluding on-site incineration, and off-site landfilling which is not considered a permanent remedy) would have to rely on soil covers and/or institutional controls (deed restrictions) placed on the Site to ensure their continued protectiveness over the long-term and would not provide the same degree of long-term permanence afforded by the selected remedy. The reliability of such controls and the potential impacts on human health and the environment, should they fail, is uncertain, and could potentially result in future remedial action costs being incurred for the Site.

The statutory preference of CERCLA, at § 121 (b) to permanently and significantly reduce the volume, toxicity or mobility of hazardous substances through treatment technologies (to the maximum extent practicable) is satisfied by the selected remedy. Additionally, this preference for treatment is more fully addressed by the selected remedy in comparison to those other alternatives which only provide containment, or disposal (especially off-site disposal without prior treatment), or a less significant reduction in the volume, toxicity or mobility. The magnitude of the reductions achieved through implementation of the selected remedy has been determined to be very significant (based upon the site-specific treatability study conducted with solvent extraction which showed a mass reduction of greater than 95% for PCBs). Furthermore, the concentrations of contaminants in the treatment residuals from these treatability studies were shown to be consistently reproducible, in contrast to the results from the other alternative treatment technologies evaluated. More specifically, extraction efficiencies obtained from this Site and those compiled from other treatability study results available from vendors of this technology (see Site Administrative Record) consistently shows that greater than 95% removal of PCBs from soils can be achieved and that a 1 ppm PCB residual level is attainable using the solvent extraction technology. These technical facts are further supported by statements in the Administrative Record from EPA technical personnel actively involved with solvent extraction technologies under the SUPERFUND INNOVATIVE TECHNOLOGY EVALUATION (SITE) program.

The selected remedy also utilizes alternative treatment technologies while providing similar advantages and disadvantages to the other alternative technologies considered relative to their short-term effectiveness at the Site (i.e., excavation and increased truck traffic at the Site are inherent impacts over the short-term for all SC alternatives, except no-action). Additionally, however, the potential short-term air quality impacts from the on-site incineration of the contaminated soils/sediments were considered to be significant, given the proximity of the neighboring community to the Site, and the existence of numerous on-site workers operating the incineration unit.

The selected remedy, in comparison to all other SC alternatives evaluated, was considered to be relatively easy to implement from both a technical and administrative feasibility standpoint. All alternatives which utilized an innovative treatment technology would be somewhat limited by the availability of only a few vendors offering the required, specialized services. Only on-site incineration appeared to be more easily implementable overall due to the increased numbers of operators of this more common technology.

A major "balancing factor" considered during the remedy selection process for this Site was the cost of implementing the remedial action, including operation and maintenance costs incurred over the life of the remedy. The results of this comparative balancing indicated that the costs associated with the selected remedy do not far exceed the costs associated with the other source control alternatives analyzed, and are proportional to the substantially greater human health and environmental protection and technical reliability provided by implementation of this remedy. That is to say, the selected remedy is cost-effective in that its overall effectiveness is proportionate to its costs, even though the costs of the selected remedy are greater than the costs associated with several of the other source control alternatives considered (excluding off-site landfilling, on-site incineration, and on-site vitrification).

Finally, the two "modifying criteria" were factored into the final remedy selection process for this Site following the formal public comment period for the proposed plan and the RI/FS. In summary, both state and community acceptance were expressed for the selected remedy, and the eventual long-term, permanent remediation of the Site. Comments from both the State of Maine and the community urged EPA to return the Site to a useable condition, and expressed serious reservations about capping the

Site with soil or creating a landfill within the Augusta city limits. Specific comments made relative to the selected remedy can be found in Appendix A to this ROD.

Management of Migration

As noted previously, the selection process discussed herein for the management of migration alternatives focused primarily on the "primary balancing criteria."

In the comparison of the groundwater alternatives (MM-1; Minimal No-Action, and MM-3; Groundwater Extraction and Treatment), it was clear that alternative MM-3 provided the best balance from among all the criteria. This was especially true relative to the cost, long-term effectiveness and permanence, and short-term effectiveness gained by selection of this alternative. Additionally, this alternative satisfies the statutory preference for treatment and does not require the use of management controls over the long-term to be protective and comply with ARARs. Furthermore, by utilizing treatment of the groundwater, the reduction in the toxicity, mobility, and volume is orders of magnitude more significant than results from the minimal no-action alternative.

With respect to the two alternatives evaluated for remediation of the PCB-contaminated Riggs Brook sediments (SE-1; Minimal No-Action, and SE-2; Excavation and Off-Site Disposal), both would comply with ARARs and would be protective of human health and the environment using varying approaches. However, the short- and long-term effectiveness of each alternative varies significantly. This was especially significant under SE-2 where excavation of the wetlands within Riggs Brook would be required to successfully implement this alternative in order to achieve the 1 ppm PCB cleanup goal. Such excavation would cause significant short-term environmental damage to this wetland area, but would not likely require long-term monitoring upon completion. In contrast, under SE-1, contaminated PCB sediments would remain within Riggs Brook at a maximum concentration of 5 ppm without causing any short-term impacts, but would require extensive monitoring over the long-term. Based upon a review of these facts, EPA, in consultation with the U.S. Fish & Wildlife Service and the National Oceanic and Atmospheric Administration, determined that the potential, irreversible environmental damage through the implementation of SE-2 outweighed the disadvantages associated with leaving the contaminated sediments in place according to SE-1.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Site is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is cost-effective. The selected remedy also satisfies the statutory preference for treatment which permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principle element. Additionally, the selected remedy utilizes alternative treatment technologies to the maximum extent practicable.

A. The Selected Remedy is Protective of Human Health and the Environment

The selected remedy for the Site will permanently reduce the risks presently, and in the future, posed to human health and the environment by the contaminated soils, sediments, surface waters, vapors, and groundwater and thereby result in a protective remedy.

The soil and sediment cleanup levels to be attained through excavation and treatment will reduce the risks associated with these contaminated materials to a level protective of human health and the environment. These target cleanup levels address the risks from direct contact and incidental ingestion of contaminated soils and sediments as well as from the inhalation of vapors originating from the contaminated soils and sediments. Treatment of the soils and sediments will also protect groundwater and surface waters from additional contamination by removing the sources of the contamination. The Feasibility Study identified three substances in the soils and sediments requiring remediation: PCBs, cPAHs, and lead. The selected remedy (excavation and on-site solvent extraction of all on-site soils and sediments exceeding the target cleanup levels; off-site incineration of the extracted contaminants; on-site solidification/stabilization of any solid residue failing EP toxicity or TCLP tests; and ultimate disposal in a licensed, off-site chemical waste landfill of residues exceeding cleanup levels or undergoing further on-site treatment by solidification/stabilization) will significantly reduce the risks associated with all three compounds to a level protective of human health and the environment. This level (for PCBs and cPAHs) is well within the 10-4 to 10-7 cancer risk range that EPA has determined to be protective of human health (i.e., individual residual risks estimated to be 5 x 10-6 or a cumulative residual risk of approximately 1 x 10-5), and well below the level at which no noncarcinogenic, adverse health effects to lead will occur.

The pumping and off-site treatment, at a permitted facility, of the on-site surface waters will also be consistent with the target cleanup goals which have been established for the three contaminants of concern in the surface waters, namely, PCBs, lead, and aluminum. These goals are based on EPA's Ambient Water Quality Criteria (AWQC), as to be considered guidelines. These criteria are shown in Table 10.

The groundwater target cleanup levels established for the Site are the Federal MCLs and Maine MEGs for PCBs, benzene, and 1,4-dichlorobenzene (see Table 11). Whereas, in the case of 1,4-dichlorobenzene, the state and federal standards differ, EPA adopted the more stringent of the two standards as the target cleanup level for the Site.

The groundwater treatment method selected (groundwater collection and on-site treatment by carbon adsorption) will reduce the concentrations of all contaminants to these target cleanup levels.

The minimal no-action approach to managing the localized areas of low-level (less than 5 ppm) PCB contamination within the Riggs Brook sediment will protect human health and the environment through the long-term monitoring of Riggs Brook sediments and biota (fish), and the implementation of educational programs for the local community. Thus, this approach provides environmental protection without disturbing the currently localized PCB-contaminated sediments within Riggs Brook and the associated wetlands through excavation activities. .

B. The Selected Remedy Attains ARARs

This remedy will meet or attain all applicable or relevant and appropriate Federal and state requirements that apply to the Site.

Federal environmental laws which are applicable or relevant and appropriate to the selected remedial action at the site are:

Resource Conservation and Recovery Act (RCRA)
Toxic Substances Control Act (TSCA)
Clean Water Act (CWA)
Fish and Wildlife Coordination Act (FWCA)
Safe Drinking Water Act (SDWA)
Clean Air Act (CAA)
Occupational Safety and Health Act (OSHA)

Table 12 lists action-specific ARARs and TBCs for the remedy selected for the Site. Table 13 lists potential chemical-specific Federal and State ARARs and gives a brief synopsis of

TABLE 10

PROPOSED TARGET CLEAN-UP LEVELS FOR ON-SITE SURFACE WATER[1]

O'CONNOR SITE
AUGUSTA, MAINE

(Concentrations in μg/ℓ or ppb)

Chemical	Guidelines Considered	Achievable Detection Limit[5]	Target Clean-up Level
PCBs	0.014/2.0 (AWQC)[2]	0.065	0.065
Lead	1.94 (AWQC)[3]	1	1.94
Aluminum	87/750 (AWQC)[4]	45	87

NOTES:

[1] On-site surface water bodies include the upland marsh, upper lagoon, and lower lagoon.

[2] The AWQC (Ambient Water Quality Criterion) for PCBs to protect freshwater aquatic life is 0.014 μg/ℓ as a 24-hour average. This concentration was derived based on the high bioconcentration factor of PCBs in aquatic organisms; however, the available data indicate that acute toxicity in freshwater aquatic life probably will occur only at concentrations above 2.0 μg/ℓ.

[3] The AWQC for lead established by USEPA is 1.94 μg/ℓ for a four-day average concentration, not to be exceeded more than once every three years, for a hardness of 67 μg/ℓ CaCO3 (measured in Riggs Brook) (ICF-Clement, January 1988).

[4] The AWQC for aluminum established by USEPA (1988) is a maximum concentration in freshwater of 87 μg/ℓ, a four-day average, not to be exceeded more than once every three years on the average. The one-hour average concentration of aluminum should not exceed 750 μg/ℓ more than once every three years on the average, at a pH of 6.5 to 9.0.

[5] The Achievable Detection Limits are: 0.065 μg/ℓ PCBs derived from the RCRA Method 8080 Method Detection Limit; 1 μg/ℓ lead derived from the RCRA Method 7421 Method Detection Limit; and 45 μg/ℓ aluminum derived from the RCRA Method 6010 Instrument Detection Limit.

TABLE 11

PROPOSED TARGET CLEAN-UP LEVELS FOR GROUNDWATER

O'CONNOR SITE
AUGUSTA, MAINE

(Concentrations in µg/ℓ or ppb)

Chemical	Target Clean-up Levels	Basis for Selection[1]	Individual Carcinogenic Risk Associated with Chemical[2]	Total Carcinogenic Risk for Combination of Chemicals[3]
PCBs	0.5	ME MEG	1.1×10^{-4}	1.3×10^{-4}
Benzene	5	MCL	7.43×10^{-6}	
1,4-Dichlorobenzene	27	ME MEG	1.54×10^{-5}	

Notes:

[1] Target clean-up levels were developed based on ARARs, as follows:

MCL - Maximum Contaminant Level is an enforceable standard promulgated under the Safe Drinking Water Act. MCLs are available for benzene and 1,4-dichlorobenzene.

MEG - Maximum Exposure Guideline is an enforceable standard promulgated under the Maine Rules. MEGs are available for PCBs and 1,4-dichlorobenzene.

[2] The individual carcinogenic risks associated with the target clean-up level for each chemical were calculated.

[3] The total carcinogenic risk for the combination of individual target clean-up levels was calculated by adding the individual risks associated with each of the chemical target clean-up levels.

[4] If the TCL for PCBs is set at the RCRA Method Detection Limit of 0.065 µg/ℓ, the associated risk is 1.43×10^{-5}.

[5] If the TCL for 1,4-dichlorobenzene is set at the CLP Contract Required Detection Limit of 10 µg/ℓ, the associated risk is 5.71×10^{-6}.

Table 12

POTENTIAL ACTION-SPECIFIC ARARS

O'CONNOR SITE

	REQUIREMENTS	REQUIREMENT SYNOPSIS
Federal Regulatory Requirements	RCRA - Standards for Owners and Operators of Permitted Hazardous Waste Facilities (40 CFR Parts 264.10 - 264.18)	General facility requirements outline waste analysis, security measures, and training requirements. Requirements apply to the storage, treatment, and disposal of hazardous waste.
	RCRA - Preparedness and Prevention (40 CFR Parts 264.30 - 264.37)	This regulation outlines safety equipment and spill-control requirements for hazardous waste facilities. Part of the regulation includes a requirement that facilities be designed, maintained, constructed, and operated to minimize the possibility of an unplanned release that could threaten human health or the environment. It also applies to the storage, treatment, and disposal of hazardous waste.
	RCRA - Contingency Plan and Emergency Procedures (40 CFR Parts 264.50 - 264.56)	This regulation outlines the requirements for emergency procedures to be used explosions and fires. This regulation also requires that threats to public health and the environment be minimized. Requirements apply to the storage, treatment, and disposal of hazardous waste.
	RCRA - Manifest System, Recordkeeping, and Reporting (40 CFR Parts 264.70 - 264.77)	This regulation details the manifesting requirements for an on-site facility that stores, stores, treats, or disposes of hazardous waste.
	RCRA - Groundwater Protection (40 CFR Parts 264.90 - 264.109)	Under this regulation, groundwater monitoring program requirements are outlined for facilities that store, treat, or dispose of hazardous waste.
	RCRA - Closure and Post-closure (40 CFR Parts 264.110 - 264.120)	This requirement details the specific requirements for closure and post-closure of hazardous waste facilities.
	RCRA - USEPA Regulations on Land Disposal Restrictions - "Land Ban" (40 CFR Part 268)	These regulations outline land disposal requirements and restrictions for specified hazardous wastes. The following restrictions may govern on-site wastes: (1) if a hazardous waste is present which contains HOCs in concentrations equal to or greater than 1,000 mg/kg, it must be incinerated prior to disposal, effective November 8, 1990; and (2) if the on-site waste exhibits a hazardous characteristic as defined in 40 CFR 261 (e.g., EP Toxicity), then it must be treated such that it no longer exhibits the characteristic.
	RCRA - Landfills (40 CFR Parts 264.300 - 264.339)	This regulation covers design and operating requirements, as well as post-closure care options for landfills. Closure and post-closure care must be attained in accordance with either the outlined disposal requirements or by the site-specific alternate method.

TABLE 12 (continued)
POTENTIAL ACTION-SPECIFIC ARARS
O'CONNOR SITE

	REQUIREMENTS	REQUIREMENT SYNOPSIS
Federal Regulatory Requirements (continued)	RCRA - Surface Impoundments (40 CFR Parts 264.220 - 264.249)	This regulation establishes design and operating requirements, as well as closure and post-closure options for surface impoundments. If all hazardous wastes cannot be removed or decontaminated, the surface impoundment must be capped and receive post-closure care.
	RCRA - Waste Piles (40 CFR Parts 264.250 - 264.269)	This regulation establishes procedures, operating requirements, closure and post-closure options for waste piles. If removal or decontamination of all contaminated subsoils is not possible, closure and post-closure requirements for landfills must be attained.
	CWA, Section 404(b)(1) - Permits for Dredged or Fill Material (40 CFR 230)	Under this regulation, discharges of dredged or fill material into U.S. waters are regulated.
	TSCA - Markings of PCBs and PCB Items (40 CFR Parts 761.40 - 761.45)	Greater than 50-ppm PCB storage areas, storage items, and transport equipment must be marked with the M_L mark.
	TSCA - Storage and Disposal (40 CFR Parts 761.60 - 761.79)	This requirement specifies the requirements for storage and disposal/destruction of PCBs in excess of 50 ppm.
	TSCA - Records and Reports (40 CFR Parts 761.180 - 761.193, also 40 CFR Parts 129.105, 750)	This regulation outlines the requirements for recordkeeping for storage and disposal of >50-ppm PCB items.
	CAA - National Primary and Secondary Ambient Air Quality Standards for Particulate Matter (40 CFR Parts 50.6 - 50.7)	This regulation specifies maximum primary and secondary 24-hour concentrations for particulate matter.
	OSHA - General Industry Standards (29 CFR Part 1910)	This regulation specifies the 8-hour, time-weighted average concentrations for various organic compounds.
	OSHA - Safety and Health Standards for Federal Service Contracts (29 CFR Part 1926)	This regulation specifies the type of safety equipment and procedures to be followed during site remediation.
	OSHA - Recordkeeping, Reporting, and Related Regulations (29 CFR Part 1904)	This regulation outlines the recordkeeping and reporting requirements for an employer under OSHA.
	DOT Rules for the Transportation of Hazardous Materials (49 CFR Parts 107, 171.1 - 172.558)	This regulation outlines procedures for the packaging, labeling, manifesting, and transport of hazardous materials.
	Fish and Wildlife Coordination Act (16 U.S.C. 661)	This regulation requires any federal agency that proposes to modify a body of water to consult with the U.S. Fish and Wildlife Services. This requirement is addressed under CWA Section 404.

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TABLE 12 (continued)
POTENTIAL ACTION-SPECIFIC ARARS
O'CONNOR SITE

	REQUIREMENTS	REQUIREMENT SYNOPSIS
Federal Regulatory Requirements (continued)		
	CWA - Natural Resource Damage Assessment (43 CFR Part 11)	This regulation outlines procedures for restoring rehabilitating, replacing, or acquiring the equivalent of natural resources damaged by hazardous substance releases.
	40 CFR Part 6 Appendix A Protection of Wetlands Executive Order (EO 11990)	This EO prohibits the undertaking of new construction in wetlands, which includes dredging.
	40 CFR Part 6 Appendix A Floodplain Management Executive Order (EO 11988)	This EO outlines requirements for actions taken in floodplains.
State Regulatory Requirements		
	Maine Solid Waste Management Rules: Landfill Disposal Facilities (38 MRSA, Section 1301 et seq., Chapters 400 - 405)	These rules outline regulations for landfills, including initial investigation, site groundwater, and operating and closure plans.
	Maine Hazardous Waste Management Rules (38 MRSA, Section 1301 et seq., Chapters 800 - 802, 850, 851, 853 - 857)	These requirements correspond to RCRA hazardous waste regulations. Compliance with RCRA will generally achieve compliance with these regulations.
	Maine Natural Resources Protection Act (NRPA) (38 MRSA, Chapter 3, Section 480)	This act replaced the Great Ponds Act; Alteration of Rivers, Streams, and Brooks; Freshwater Wetlands Act; and Coastal Wetlands Act. Additionally, this law protect fragile mountain areas and significant wildlife areas. This act prohibits degradation or destruction of those natural resources by prohibiting alteration in or adjacent to a protected natural area without a permit. Permits are required for various alterations including: dredging, draining, or dewatering; filling; or altering a permanent structure.
	Maine Water Pollution Control Law: Solid Waste Disposal Areas; Location (38 MRSA, Chapter 3, Article 2, Sections 420, 421)	This law requires a 300-foot zone between a public or private solid waste disposal area boundary and any classified body of surface water.
	Maine Standards for Classification of Surface Waters (38 MRSA, Chapter 3, Sections 468, 470)	These standards cover restoration, enhancement and preservation of state waters.
	Maine Air Quality Control Laws; Protection and Improvement of Air (38 MRSA, Chapter 4, Sections 581 - 611)	This law and its associated regulations detail the requirements, limitations, and exemptions of state air emission regulations for specified substances.
	Maine Site Location of Development Law (38 MRSA, Chapter 3, Section 484 375)	This law regulates impacts on existing uses scenic character, and natural resources.
	Maine Water Pollution Control Law (38 MRSA, Chapter 3, Article 2, Section 413 et seq.)	This law regulates discharge of waste in Maine, including surface waste water disposal systems.

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TABLE 12 (continued)

POTENTIAL ACTION-SPECIFIC ARARS

O'CONNOR SITE

	REQUIREMENTS	REQUIREMENT SYNOPSIS
Federal Criteria, Advisories, and Guidance To Be Considered		
	USEPA Guidance Document - "Covers for Uncontrolled Hazardous Waste Sites" (USEPA/540/2-85/002)	This guidance outlines the three components that offer detailed guidance for the design of a cover system which will achieve the specified performance standards of RCRA landfill covers.

Table 13

POTENTIAL CHEMICAL-SPECIFIC ARARS
O'CONNOR SITE

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS
Groundwater/Surface Water			
Federal Regulatory Requirements	SDWA - Section 1412 - Maximum Contaminant Levels (MCLs) (40 CFR 141.11 - 141.16)	Relevant and Appropriate	MCLs have been promulgated for a number of common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.
	RCRA - Subpart F, Groundwater Protection Standards, (40 CFR 264.94)	Relevant and Appropriate	This regulation outlines three possible standards (i.e., maximum concentrations of contaminants, alternate concentration limits, and background concentrations) available under Subpart F for setting a clean-up level for remediating groundwater contamination from a RCRA facility.
State Regulatory Requirements	Maine Standards for Classification of Minor Discharges (38 M.R.S.A., Chapter 3, Section 468)	Applicable	Riggs Brook is classified as a Class B water under the state water quality standards.
	Maine Standards for Classification of Groundwater (38 M.R.S.A., Chapter 3, Section 470)	Applicable	Groundwater is classified under the Maine standards. The groundwater at the O'Connor site is classified as GW-A (i.e., water that shall be of such quality that it can be used for domestic purposes).
	Maine Drinking Water Rules (Code of Maine Rules [CMR], 10 - 144A, Chapter 231, Section 7)	Relevant and Appropriate	Maine Maximum Contaminant Levels (MCLs) have been promulgated for a number of contaminants. Additionally, organic chemicals which have no established MCLs are addressed on case-by-case basis. When the state levels are more stringent than federal levels, the state levels will be used.
	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (CMR 10-144A, Chapter 233, Appendix C)	Relevant and Appropriate	These rules establish criteria for potentially hazardous contaminants occurring in private residential water systems.
	Maine Drinking Water Rules (Code of Maine Rules [CMR], 10 - 144A, Chapter 231, Section 7)	Relevant and Appropriate	Maine Maximum Contaminant Levels (MCLs) have been promulgated for a number of contaminants. Additionally, organic chemicals which have no established MCLs are addressed on case-by-case basis. When the state levels are more stringent than federal levels, the state levels will be used.
	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (CMR 10-144A, Chapter 233, Appendix C)	Relevant and Appropriate	These rules establish criteria for potentially hazardous contaminants occurring in private residential water systems.
Federal Criteria, Advisories, and Guidance	Health Advisories (HAs) (USEPA Office of Drinking Water)	To Be Considered	HAs are estimates of risks due to consumption of contaminated drinking water; they consider noncarcinogenic effects only.

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TABLE 13 (continued)
POTENTIAL CHEMICAL-SPECIFIC ARARS
O'CONNOR SITE

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS
Groundwater/Surface Water			
Federal Criteria, Advisories, and Guidance (continued)	USEPA Risk Reference Doses (RfDs)	To Be Considered	RfDs are dose levels developed by USEPA for noncarcinogenic effects. They are considered to be the levels unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.
	USEPA Carcinogen Assessment Group (CAG) Potency Factors (PFs)	To Be Considered	PFs are developed by USEPA from Health Effects Assessments (HEA) or evaluations by the CAG and present the most up-to-date cancer risk potency information.
	Acceptable Intake - Chronic (AIC) and Subchronic (AIS) - USEPA Health Assessment Documents	To Be Considered	AIC and AIS values are developed from RfDs and HAs for noncarcinogenic compounds.
	USEPA Office of Water Guidance - Water-related Fate of 129 Priority Pollutants (1979)	To Be Considered	This guidance manual gives transport and fate information for 129 priority pollutants.
Air			
Federal Regulatory Requirements	CAA - National Primary and Secondary Ambient Air Quality Standards (NAAGS) for Particulate Matter (40 CFR Parts 50.6 - 50.7)	Applicable	This regulation specifies maximum primary and secondary 24-hour concentrations for for particulate matter.
State Regulatory Requirements	Maine Air Quality Control Laws; Protection and Improvement of Air (38 MRSA, Chapter 4, Section 581-611)	Applicable	This law and its associated regulations detail the requirements, limitations, and exceptions of state air emission regulations for specified substances.

these requirements. This table also includes those chemical-specific advisories, guidances, etc. which, while not ARARs, are to be considered (TBC) in setting target cleanup levels at the Site. Finally, Table 14 lists potential location-specific ARARs and TBCs for the Site, along with a synopsis of these requirements.

A brief narrative summary of the ARARs, as related to the selected remedy, follows.

1. Action-specific ARARs

The source control portion of the remedial action will essentially involve the excavation of approximately 23,500 cubic yards of soil and sediments from the Site for on-site treatment through a solvent extraction process; the off-site incineration of the PCB- and cPAH-concentrated extract from the solvent treatment process; the on-site stabilization/solidification of any solid residue exhibiting EP or TCLP toxicity; the disposal in an off-site chemical waste landfill of the solid residue exceeding cleanup goals and/or undergoing solidification; and the pumping and off-site treatment of contaminated surface waters. The management of migration portion of the remedy will involve the construction of one or more deep bedrock extraction wells to collect contaminated groundwater, preliminary filtration of suspended solids and oil droplets, carbon adsorption treatment, and discharge of the treated water back into the aquifer.

a. Federal

The Resource Conservation and Recovery Act (RCRA) governs the transportation, storage, treatment and disposal of hazardous wastes. A substance is a hazardous waste as defined by RCRA at 40 CFR 261 if it either is included on a specified list or exhibits any of the characteristics (i.e., ignitability, corrosivity, reactivity or EP toxicity) of a hazardous waste. Due to the presence at the Site of certain lead-contaminated soils which may exhibit the characteristic of EP or TCLP toxicity and the placement of these materials in a land treatment facility according to the selected remedy, the Land Disposal Restrictions (LDR) set forth in Part 268 of RCRA are potentially applicable to the implementation of this remedy. LDR will prohibit (once promulgated) the land disposal of characteristic wastes unless and until either: (1) the wastes have been treated to the extent that they no longer exhibit the offending characteristic(s); or, (2) the requirements of a treatability variance pursuant to 40 CFR 268.44 have been met. LDR will be satisfied by the selected remedy through the implementation of stabilization/solidification to the maximum extent practicable of any excavated and treated materials which exhibit EP or TCLP toxicity; thereby addressing

Table 14

POTENTIAL LOCATION-SPECIFIC ARARS
O'CONNOR SITE

SITE FEATURE	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS
Wetlands			
Federal Regulatory Requirements	CWA, Section 404 (b)(1) - for Dredged or Fill Material (40 CFR 230)	Applicable	Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative that has lesser effects is available.
	Fish and Wildlife Coordination Act (16 U.S.C. 661)	Applicable	This act requires that any federal agency that proposes to modify a body of water must consult with the U.S. Fish and Wildlife Service. This requirement is addressed under CWA, Section 404.
	40 CFR Part 6 Appendix A, Protection of Wetlands Executive Order (EO 11990)	Applicable	This act sets forth USEPA policy for carrying out the provisions of the Protection of Wetlands Executive Order (EO 11990). Under this Order federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands.
State Regulatory Requirements	Maine Natural Resources Protection Act (NRPA) (38 M.R.S.A., Chapter 3, Section 480)	Applicable	This act replaced the Great Ponds Act; Alteration of Rivers, Streams, and Brooks; Freshwater Wetlands Act; and Coastal Wetland Acts. Additionally, this law protects fragile mountain areas and significant wildlife areas. This act prohibits degradation or destruction of these natural resources by prohibiting alteration in or adjacent to a protected natural area without a permit. Permits are required for various alternatives including dredging, draining or dewatering; filling; or altering a permanent structure.
	Maine Hazardous Waste Management Rules, (38 M.R.S.A., Section 1301 et seq., Chapter 854)	Relevant and Appropriate	These regulations outline the criteria for the construction, operation, and maintenance of a new facility or increase in an existing facility for the storage, treatment, or disposal of hazardous waste. Specifically, no portion of the site may be located within a wetland.
Floodplains			
Federal Regulatory Requirements	RCRA - Location Standards (40 CFR Part 264.18)	Applicable	A facility located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous wastes by a 100-year flood.
	40 CFR Part 6 Appendix A Floodplain Management Executive Order (EO 11988)	Applicable	This act sets forth USEPA policy for carrying out the provisions of the Floodplain Management Executive Order (EO 11988). Under this order, federal agencies are required to minimize potential harm to or within floodplains and to avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains
State Regulatory Requirements	Maine Hazardous Waste Management Rules (38 M.R.S.A., Section 1301 et seq., Chapter 854)	Applicable	These regulations outline the criteria for the construction, operation, and maintenance of a new facility or increase in an existing facility for the storage, treatment, or disposal of hazardous waste. Specifically, no portion of the site may be within 300 feet of any 100-year floodplain.

TABLE 14 (continued)
POTENTIAL LOCATION-SPECIFIC ARARS
O'CONNOR SITE

SITE FEATURE	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS
Riggs Brook			
Federal Regulatory Requirements	Fish and Wildlife Coordination Act (16 U.S.C. 661)	Applicable	This act requires that any federal agency that proposes to modify a body of water must consult with the U.S. Fish and Wildlife Service. This requirement is also addressed under CWA, Section 404.
State Regulatory Requirements	Maine Standards for Classification of Fresh Surface Waters (38 M.R.S.A., Chapter 3, Section 468)	Applicable	Riggs Brook is classified as a Class B water body under the state water quality standards.
	Maine Natural Resources Protection Act (NRPA) (38 M.R.S.A., Chapter 3, Section 480)	Applicable	This act replaced the Great Ponds Act; Alteration of Rivers, streams, and brooks; Freshwater Wetlands Act; and Coastal Wetland Acts. Additionally, this law protects fragile mountain areas and significant wild life areas. This act prohibits degradation or destruction of these natural resources by prohibiting alteration in or adjacent to a protected natural area without a permit. Permits are required for various alternatives including dredging, draining or dewatering; filling; or altering a permanent structure.
	Maine Water Pollution Control Law: Solid Waste Disposal Areas; Location (38 M.R.S.A., Chapter 3, Article 2, Section 421)	Applicable	No boundary of any public or private solid waste disposal area shall lie closer than 300 feet to any classified body of surface water. Also known as the Three Hundred Foot Law.
Groundwater			
State Regulatory Requirements	Maine Standards for Classification of Groundwater (38 M.R.S.A., Chapter 3, Section 470)	Applicable	Groundwater is classified under the Maine standards as Class GW-A, which stipulates that the groundwater be of such quality that it can be used for domestic purposes.
Other Natural Resources			
State Regulatory Requirements	Maine Site Location of Development Law (38 M.R.S.A., Chapter 3, Section 484)	Applicable	The development can not adversely affect existing uses, scenic character, or natural resources in the municipality or in neighboring municipalities.
	Maine - Regulations of the Site Location of Development Law (38 M.R.S.A., Chapter 3, Section 484 et seq., Chapter 375)	Applicable	This requirement defines the natural resources to which the site location act applies.
	Maine Solid Waste Management Rules: Landfill Disposal Facilities (38 M.R.S.A., Section 1301 et seq., Chapters 400 - 406)	Applicable	Waste shall be placed a minimum of 5 feet above the seasonal high water table and bedrock according to this requirement. Also, the closing requirements for landfills are outlined.

(1), as noted above. In the event that any substances continue to fail EP toxicity or TCLP tests even following exhaustive stabilization/solidification efforts, a treatability variance under 40 CFR 268.44 will be sought so that the substance may properly be land-disposed pursuant to LDR; thereby addressing (2), as noted above. It should be noted that, regardless of whether it becomes necessary to obtain a treatability variance within the LDR framework, the ARAR itself will not be waived, but rather the LDR requirements will be fully satisfied.

Apart from the applicability of LDR to characteristic wastes at the Site, many other RCRA requirements address the same kinds of actions that will be taken at the Site and are therefore relevant and appropriate to the remedial activities. EPA will comply with the substantive provisions of RCRA regulations governing: Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities, General Facility Standards (40 CFR 264.10-264.18); Preparedness and Prevention (40 CFR 264.30-264.37); Contingency Plan and Emergency Procedures (40 CFR 264.50-264.56); Groundwater Protection (40 CFR 264.90-264.101); Closure and Post-Closure (40 CFR 264.110-264.120, as interpreted by EPA guidance for use at CERCLA sites where RCRA closure is relevant and appropriate but not applicable); Landfills (40 CFR 264.300-264.317); Surface Impoundments (40 CFR 264.220-264.231); and Waste Piles (40 CFR 264.250-264.259). In addition, for the extract from the solvent extraction process that will be transported off-site for incineration and the contaminated surface waters being transported off-site for treatment, EPA will comply with the relevant and appropriate RCRA regulations for Standards Applicable to Generators and Transporters of Hazardous Wastes (40 CFR 262 and 263) and Department of Transportation Rules for Transportation of Hazardous Materials (49 CFR Parts 107, 171.1-172.558).

Under the Toxic Substances Control Act (TSCA), soils contaminated with PCBs at concentrations greater than 50 ppm and that are disposed of after February 17, 1978 must be disposed of in accordance with 40 CFR 761 Subpart D. Since the Site contains PCBs at concentrations over 50 ppm, and since disposal will occur after 1978 as part of the remedial action, TSCA regulations are applicable to the selected source control action once excavation takes place. These regulations require treatment by incineration or its destruction equivalent, or chemical waste landfilling. EPA's selected remedy will meet this requirement through treatment by solvent extraction of PCB-contaminated soils and sediments and incineration of the extracted PCBs. EPA has determined that the destruction of PCBs down to concentrations of less than 2 ppm constitutes an equivalent level of performance to incineration within the meaning of § 761.60(e) of TSCA. The selected remedy satisfies the equivalency determination by requiring that the solid residue from the solvent extraction process which contains PCBs in concentrations greater than 1 ppm be disposed of in a chemical landfill as defined in § 761.75 of TSCA. Thus, the selected remedy will fulfill TSCA's requirements through both treatment by a process which achieves a level of performance equivalent to incineration (solvent extraction) and disposal within a TSCA-permitted, chemical waste landfill.

The TSCA PCB Spill Cleanup Policy (40 CFR 761 Subpart G) is not a binding regulation but a statement of EPA policy. Thus, it is not an ARAR at the Site but is a TBC. The Policy requires that spills of PCBs at unrestricted access sites be cleaned up to a level of 10 ppm, with a minimum of 10 inches of soil removed from the surface of the entire spill area and replaced with soil containing less than 1 ppm PCBs. The selected remedy is consistent with this requirement because all soils above 1 ppm PCBs will be excavated and treated, with only soils below 1 ppm PCBs being returned to the unrestricted area.

Regulations under the Occupational Safety and Health Act (OSHA) apply to the performance of the remedial action as it involves workers at the Site. EPA will comply with the OSHA regulations including the General Industry Standards (29 CFR 1910); Safety and Health Standards (29 CFR 1926); and the substantive provisions of the Record Keeping, Reporting and Related Regulations (29 CFR 1904).

The National Primary and Secondary Ambient Air Quality Standards (40 CFR Part 50), promulgated under the Clean Air Act, are relevant and appropriate to the selected remedy. During the excavation and treatment of contaminated soils and sediments at the Site and during the groundwater treatment, air emissions will be monitored and the NAAQS (i.e., PM-subscript 10, total suspended particulate-TSP, lead, etc.) will be attained through the use of appropriate air pollution control equipment.

With respect to the unavoidable impacts of the cleanup on the wetland areas at the Site (since there are no practicable alternatives), the selected remedy will also meet the requirements of the Clean Water Act (CWA), the Fish and Wildlife Coordination Act (FWCA), and the Protection of Wetlands and Floodplain Management Executive Orders (EO 11990 and EO 11988). No pollutants or any other materials will be discharged to surface waters. The removal of contaminated soils, sediments and surface water from the wetland areas/waters of the U.S. on the Site (the upper and lower lagoons and the upland marsh) will comply with the regulations and guidelines under section 404 of CWA. EPA will avoid degradation of these areas to the maximum extent possible through careful construction practices and will create wetlands at the Site to compensate and restore those wetland areas that are affected by the remedial action. As required by FWCA, EPA has preliminarily consulted with the U.S. Fish and Wildlife Service concerning the effect of the proposed remedy on these wetland areas.

b. State

The selected remedy will also attain action-specific Maine ARARs, including the Maine Freshwater Wetlands Act (38 M.R.S.A., Chapter 3, sections 405-410); the Maine Hazardous Waste Management Rules at 38 M.R.S.A., sections 1301 et seq., Chapters 850, 851, 853-857, sections 1319 et seq., Chapters 800-801, sections 1304 et seq., Chapter 802, and Chapter 3, article 2, section 420; Groundwater Protection Regulations at 38 M.R.S.A. Chapter 3, article 4A, section 470; and Ambient Air Quality Standards at 38 M.R.S.A. section 584, Chapter 110. In addition, construction of groundwater monitoring wells will comply with Maine DEP, Bureau of Water Quality Control regulations, chapter 543, which apply only to injection wells but may be relevant and appropriate to the selected remedy.

2. Chemical-specific ARARs

In determining which contaminants at the Site required remediation, EPA consulted both Federal and State ARARs as well as other criteria for protectiveness. As a result, EPA has set target cleanup goals for three soil contaminants (PCBs, cPAHS, and lead), three surface water contaminants (PCBs, lead, and aluminum), and three groundwater contaminants (PCBs, benzene, and 1,4-dichlorobenzene).

While no ARARs apply to any of the soil contaminants and/or cleanup levels established for the Site, it should be noted that EPA's target cleanup level for PCBs in the soil is consistent with the TSCA Spill Cleanup Policy which is TBC. The selected cleanup levels are also consistent with one other TBC, the Maine Rules for the Land Application of Sludge and Residuals.

There are no federal or state regulatory requirements governing the ambient concentrations of chemicals in surface water bodies. In the absence of such ARARs, as noted earlier, EPA relied upon the AWQC guidelines to the extent possible in establishing cleanup levels.

ARARs for the groundwater contaminants at the Site include the Federal Maximum Contaminant Levels (MCLs) promulgated under the Safe Drinking Water Act (40 CFR Part 141, Sections 141.11-141.16) and the State of Maine's MCLs (10-144A C.M.R., Chapter 231) and Maximum Exposure Guidelines (MEGs) (10-144A C.M.R., Chapter 233). Both the MCLs and MEGs are legally applicable only at the tap and not to an aquifer directly. Since the groundwater at the Site, classified as Class IIB under the EPA groundwater protection strategy, is being considered a possible source of drinking water, the Federal MCLs are relevant and appropriate in setting cleanup levels. Similarly, Maine classifies all groundwater in the state as a minimum Class GW-A, suitable for drinking water, rendering the State MCLs and MEGs relevant and appropriate as well. The selected groundwater remedy at the Site will meet the standards set by these ARARs.

Air emissions from the Site will comply with the NAAQS for Particulates (40 CFR 50.6), an applicable requirement, and the EPA Interim Policy for Planning and Implementing CERCLA Response Actions, Proposed Rule, 50 FR 45933 (November 5, 1985), a TBC.

3. Location-specific ARARs

As part of the source control portion of the remedy, certain contaminated soils/sediments will be excavated and contaminated surface waters pumped from three wetland areas, the upper and lower lagoons and the upland marsh. Because there is no practicable alternative to this action in order to achieve the goals established for the Site, these man-made wetlands will be destroyed during remediation. EPA will, to the maximum extent possible, restore the areas affected by the remedial action through the creation of compensatory wetlands and the use of careful construction methods. As discussed earlier in connection with action-specific ARARs, the remedial action will comply with section 404 of the Clean Water Act, and with standards set by Maine requirements, including the Maine Freshwater Wetlands Act (38 M.R.S.A. Chapter 3, sections 405-410) and the Maine Hazardous Waste Management Rules (38 M.R.S.A. sections 1301 et seq., Chapters 401, 850, 851, 853-857, sections 1319 et seq. Chapters 800-801, and sections 1304 et seq., Chapter 802), which govern actions taking place in a wetland. The remedial action will also comply with the Wetlands Executive Order (E.O. 11990), which is binding on EPA as a Federal agency, and the Fish and Wildlife Coordination Act (16 U.S.C., section 661). EPA has preliminarily consulted with the U.S. Fish and Wildlife Service concerning the effect of the selected remedy on the wetland areas on- and off-site, as required by the Fish and Wildlife Coordination Act.

The other wetlands identified in the Site area will not be directly affected by site remediation activities, and EPA will ensure their protection through any necessary sedimentation and erosion controls.

The selected remedy will comply with the Floodplain Management Executive Order (E.O. 11988) and EPA regulation 40 CFR Part 6, which implements the Executive Order. The source control portion of the remedy will have minimal effects on the 100-year floodplain located on the Site. This is due to the fairly limited extent of the floodplain within contaminated portions of the Site, and the use of careful construction practices during excavation to minimize any adverse impacts on the floodplains.

The remedial action will also comply with the Maine Site Location Law (38 M.R.S.A. Chapter 3, sections 481-490), which prohibits adverse impacts on certain natural resources.

C. The Selected Remedial Action is Cost-Effective

Of those remedial alternatives that are protective and attain ARARs, and satisfy the preference for treatment to the maximum extent practicable, EPA selected the remedy that is cost-effective in mitigating the risks posed by the soil, sediments, surface waters, and groundwater on- and off-site within a reasonable period of time. Overall, the total cost (present worth) of the selected remedy is estimated at $14.22 million as presented in Table 15.

The estimated total present worth cost of the source control component of the selected remedy is approximately $ 13.32 million. This total cost is comprised primarily of $ 5.9 million for the excavation and on-site treatment of the contaminated soils and sediments, and $ 1.72 million for off-site disposal of the approximately 5,000 cubic yards of contaminated solid treatment residues from the solvent extraction process exceeding the established target cleanup goals for the Site and/or the solidified lead-contaminated materials which may be determined to be a characteristic hazardous waste prior to solidification.

This cost is higher than that of some of the other source control alternatives; however, none of the less expensive technologies can ensure that the treated soil will reach the target cleanup goals and also provide long-term effectiveness and permanence without additional management (institutional) controls being established on the Site. Additionally, EPA has determined that this remedy will yield results that are in proportion to its cost in terms of implementability and effectiveness. Thus, while the treatment alternatives which included dechlorination and the other solvent extraction alternative evaluated are cheaper than the selected source control alternative, they do not provide the same degree of permanence or effectiveness over the long-term. Additionally, the selected source control remedy is less expensive than the on-site incineration or in-situ vitrification of the contaminated soils and sediments. Moreover, the selected approach avoids the potential for air emissions impacts which would likely result from on-site incineration, and possibly in-situ vitrification, due to the co-located lead-contaminated soils

Table 15
O'CONNOR SITE
ESTIMATED COST OF SELECTED REMEDY

SUMMARY

ITEM	ESTIMATED COST
1. Source Control Component	$13,319,000
2. Management of Migration Component	679,000
3. Riggs Brook Sediment Minimal No-Action Component	223,000
ESTIMATED TOTAL COST:	$14,221,000

on the Site.

The estimated total present worth costs of the management of migration component (which includes groundwater and Riggs Brook sediment remediation) of the selected remedy is estimated to total $ 902,000. Operation and maintenance costs (net present worth) comprise approximately 95 % or $ 855,000 of this total. This cost is approximately equal to the costs of all other management of migration alternatives considered, while providing treatment of the primary contaminants to the target levels established in a shorter period of time than MM-1 and extensive monitoring with no significant detrimental effects to the environment in and around the Site as contrasted with SE-2.

Tables 16, 17, and 18 present an itemized cost breakdown of the source control and management of migration (groundwater and Riggs Brook sediment) components, respectively, of the selected remedy in terms of the major activities, estimated volumes of materials addressed, and the estimated unit costs. While these costs are within the +50 percent to -30 percent accuracy required for Feasibility Study estimates, some changes may be made as a result of the remedial design and construction processes involved after the ROD is signed. These changes, in general, reflect modifications resulting from the engineering design process.

D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

Both the source control and management of migration components of the selected remedy are expected to provide permanent solutions to the contamination problem at the Site. Solvent extraction permanently removes PCBs and the other organic contaminants of concern from the soil, while incineration destroys these contaminants almost completely. The pumping and off-site treatment of surface waters will also permanently remove contaminants of concern from the environment. As a result, remediation of the Site soils, sediments, and surface waters will permanently reduce the risks associated with exposure to these three media to levels which are protective of human health and the environment. In addition, removal of the contaminants in these source areas will reduce the migration of contaminants into the groundwater, thereby increasing the effectiveness of the groundwater treatment component of the remedy.

Both solvent extraction and incineration are alternative treatment technologies; thus, the selected remedy also satisfies the requirement that the remedy selected utilize alternative treatment or resource recovery technologies to the maximum extent practicable.

Table 16

O'CONNOR SITE
ESTIMATED COST OF SELECTED REMEDY

SOURCE CONTROL COMPONENT

CAPITAL COSTS:

ITEM	ESTIMATED QUANTITY	ESTIMATED COST
1. Drain and treat/dispose of lagoon and marsh water	165,000 gal.	$ 102,000
2. Reroute surface water	lump sum	25,000
3. Decontaminate/demolish barn	lump sum	3,000
4. Excavate contaminated soil	23,500 cy	212,000
5. Treatment of contaminated soil	23,500 cy	5,726,000
6. Transportation and off-site landfilling of treated soil not meeting cleanup goals	5,000 cy	1,715,000
7. On-site backfilling of treated soil	18,500 cy	89,000
8. Compensatory wetlands	0.5 acre	75,000
9. Health and Safety premium (level D)	50% of Items 1 thru 4	171,000
	SUBTOTAL	$ 8,118,000
Undeveloped Design Details (25%)		$ 2,030,000
Total Estimated Capital Costs w/Undeveloped Design Details		$10,148,000
Engineering (5%)		$ 507,000
Contingency (25%)		$ 2,664,000
Total Estimated Capital, Engineering, and Contingency Costs (Present Worth)		$13,319,000

OPERATION & MAINTENANCE COSTS:

Monitoring, Maintenance, and 5-yr Review	-0-
ESTIMATED TOTAL COST (Present Worth)	$13,319,000

Table 17
O'CONNOR SITE
ESTIMATED COST OF SELECTED REMEDY

MANAGEMENT OF MIGRATION COMPONENT

CAPITAL COSTS:

ITEM	ESTIMATED COST
1. Install extraction well and treatment system	$ 48,000
OPERATION AND MAINTENANCE COSTS:	
1. Treatment system operation and maintenance Year 1: $36,000 Years 2-30: $20,000/yr Estimated Present Worth: $323,000	
2. Environmental Monitoring Years 1-30: $20,000/yr Estimated Present Worth: $308,000	
Total Esitmated Operation & Maintenance Cost	$631,000
ESTIMATED TOTAL COST (Present Worth)	$679,000

Table 18
O'CONNOR SITE
ESTIMATED COST OF SELECTED REMEDY

RIGGS BROOK SEDIMENT
MINIMAL NO-ACTION COMPONENT

ITEM	ESTIMATED COST
1. Sediment and Biota Monitoring	
Sediment (Years 2-10)[1]	$ 9,000/yr
Biota (year 5)[2]	$ 27,000
2. Annual Education Programs	
(Years 2-30)	$ 5,000/yr
3. Five-Year Site Review	
(Years 5-30)	$ 20,000/5 yr
Estimated Present Worth (Items 1-3)	$223,000
ESTIMATED TOTAL COST (Present Worth)	$223,000

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[1] Sediment monitoring will be begin after implementation of the scurce control remedial action.

[2] Biota sampling is anticipated once after five years of sediment sampling. However, additional rounds of biota sampling will be conducted if significant increases over 5-ppm PCBs occur in the sediments.

The management of migration portion of the remedy also utilizes a treatment method which will result in the permanent removal of most target contaminants. Through the collection and treatment of the contaminated groundwater, this remedy ensures that the groundwater leaving the site is restored to a level protective of human health and the environment. Use of temporary institutional controls will also ensure that the on-site groundwater poses no risk during this phase of the overall Site remediation process.

E. The Selected Remedy Satisfies the Preference for Treatment as a Principal Element

The principal component of the selected source control remedy consists of treating all soils and sediments above the target cleanup levels through a solvent extraction process, and incinerating the extract. The selected remedy thus addresses the principal threat posed by the Site soils and sediments through the use of treatment technologies. In addition, the principal threat posed by groundwater contamination at the Site will be addressed through treatment of the groundwater by carbon adsorption. The selected remedy thus satisfies the preference for treatment as a principal element of this Superfund remedy.

XII. STATE ROLE

The State of Maine, Department of Environmental Protection (DEP) has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the Remedial Investigation, Endangerment Assessment and Feasibility Study to determine if the selected remedy is in compliance with applicable or relevant and appropriate State environmental laws and regulations. The State of Maine concurs with the selected remedy for the O'Connor Co. Site. A copy of the declaration of concurrence is attached as Appendix D.

EXHIBIT A

Community Relations Activities Conducted
at the O'Connor Co. Site
in Augusta, Maine

Community relations activities conducted at the O'Connor Co. Superfund site include:

- October 27, 1984 - EPA issued a press release stating that EPA ordered the F. O'Connor Company to fence and post its property on Route 17 and to sample and analyze the contents of drums and storage tanks onsite.
- September 1985 - EPA released a community relations plan describing citizen concerns about the site, outlining a program to address these concerns, and discussing how EPA intends to keep citizens informed about and involved in site activities.
- May 13, 1986 - EPA issued a press release announcing that the Central Maine Power Company and the F. O'Connor Company entered into a consent agreement with EPA to study hazardous waste contamination at the O'Connor Co. site.
- June 11, 1986 - EPA held an informational meeting to describe the plans for the Remedial Investigation and Feasibility Study (RI/FS).
- March 25, 1987 - EPA issued a press release announcing that the Central Maine Power Company and the F. O'Connor Company entered into a modified consent agreement with EPA and the Maine Department of Environmental Protection (DEP) to investigate waste contamination at the site.
- July 1989 - EPA mailed the Proposed Plan announcing EPA's preferred alternative for addressing contamination at the site to all those on the site mailing list.
- July 12, 1989 - EPA issued a public notice in the Kennebec Journal to announce the time and place of the public informational meeting for the site, provide a brief analysis of the Proposed Plan, and invite public comment on the Feasibility Study (FS) and the Proposed Plan.

- July 13, 1989 - EPA made the Administrative Record available for public review at EPA's offices in Boston and at the Lithgow Public Library in Augusta.

- July 19, 1989 - EPA held a public informational meeting to discuss the results of the RI/FS and EPA's Proposed Plan.

- July 20 - August 19, 1989 - EPA held a public comment period on the Proposed Plan.

- August 10, 1989 - EPA held an informal public hearing to accept comments on the remedial alternatives evaluated in the FS and on the Proposed Plan.

RESPONSIVENESS SUMMARY
FOR THE
O'CONNOR CO. SUPERFUND SITE
AUGUSTA, MAINE

Public Comment Period:
July 20 through August 19, 1989

September 1989

Prepared for:
U.S. Environmental Protection Agency
Region I

Prepared by:
Booz-Allen & Hamilton Inc.
under Subcontract Number TES V-BAH-1, WA Number C01018
with CDM Federal Programs Corporation

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Preface

The U.S. Environmental Protection Agency (EPA) held a public comment period from July 20, 1989 through August 19, 1989 to provide an opportunity for interested parties to comment on the Remedial Investigation (RI) and Feasibility Study (FS) reports, and the July 1989 Proposed Plan prepared for the O'Connor Co. Superfund site (the "Site") located in Augusta, Maine. The RI, which examined the nature and extent of contamination at the Site, and the FS, which examined and evaluated various options (referred to as remedial alternatives) for addressing the contamination at the Site, were released to the public on July 13, 1989. EPA identified its preferred alternative for cleaning up the Site within the Proposed Plan before the start of the public comment period.

The purpose of this responsiveness summary is to identify the major comments raised during the public comment period and to provide EPA responses to these comments. EPA considered all of the comments summarized in this document before selecting a final remedial alternative for addressing the contamination at the Site.

This responsiveness summary is divided into the following sections:

I. Overview of the Remedial Alternatives Considered in the Feasibility Study, Including the Preferred Alternative - This section briefly outlines the remedial alternatives that are described and evaluated in the FS and the Proposed Plan.

II. Background on Community Involvement and Concerns - This section provides a brief history of community interests and concerns regarding the Site.

III. Summary of Comments Received During the Public Comment Period and EPA Responses to these Comments - This section summarizes both the written and oral comments received by EPA during the public comment period, and provides EPA responses to these comments. Part 1 contains comments received by citizens. Part 2 contains those comments received from the Potentially Responsible Parties (PRPs). A brief summary of the PRPs' comments precedes EPA's responses.

IV. Remaining Concerns - This section describes issues that may continue to be of concern to the community during the design and implementation of EPA's selected remedy for the Site. EPA will address these concerns during the Remedial Design/Remedial Action (RD/RA) phase of the cleanup process.

Also attached to this responsiveness summary are the following exhibits:

Exhibit A - This exhibit is a list of the community relations activities that EPA has conducted to date at the Site.

Exhibit B - This exhibit is a copy of the transcript from the public hearing that was held August 10, 1989.

I. OVERVIEW OF THE REMEDIAL ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY, INCLUDING THE PREFERRED ALTERNATIVE

Using the information gathered during the Remedial Investigation (RI) and the results of the Endangerment Assessment (EA) prepared for the Site, EPA identified several objectives for the cleanup of the Site. These response objectives are:

1. Reduce potential present and future public health and environmental risks from direct contact, ingestion, and/or dermal absorption with the polychlorinated biphenyl (PCB)-, carcinogenic polycyclic aromatic hydrocarbon (cPAH)-, and lead-contaminated soils and sediments located on and off the Site.
2. Reduce potential present and future public health risks from the inhalation of PCB vapors generated from the Site.
3. Reduce potential present and future public health risks from the ingestion of PCB-contaminated fish from Riggs Brook.
4. Reduce potential future public health risks from the ingestion of the PCB-, benzene-, and 1,4-dichlorobenzene-contaminated groundwater found on the Site.
5. Reduce potential present and future environmental risks to aquatic and terrestrial wildlife from exposures to the PCB-, lead-, and aluminum-contaminated on-site surface water.

Central Maine Power (CMP), a PRP, performed the RI and prepared the FS for the Site with EPA and State of Maine Department of Environmental Protection (DEP) oversight. The Feasibility Study (FS) report was specifically prepared to describe all the possible remedial alternatives that could be considered for addressing the groundwater, soil, sediment and surface water contamination present at the Site. The FS also describes the screening criteria used to narrow the list of possible alternatives from 17 to the 14 remedial alternatives that were retained for further consideration. The 14 remaining alternatives that underwent a detailed evaluation in the FS included: ten (10) remedial alternatives (referred to as source control or SC alternatives) for addressing the on-site soil, sediment, and surface water contamination; two (2) remedial alternatives to address the groundwater contamination (referred to as management of migration or MM alternatives); and two (2) remedial alternatives for addressing the sediment contamination within Riggs Brook (referred to as sediment or SE alternatives). Each of these alternatives are listed below:

Alternatives Considered in the Feasibility Study

Source Control (SC) Alternatives --

SC-1: Minimal No-Action.
SC-2: Site Capping.
SC-3: On-Site Disposal Facility.
SC-4: Off-Site Disposal at a TSCA Landfill.
SC-5: On-Site Incineration.
SC-6: On-Site Solidification.
SC-7: On-Site Vitrification.
SC-10: On-Site Alkali Metal Dechlorination.
SC-11A: On-Site Solvent Extraction and Disposal of Treated Soils.
SC-11B: On-Site Solvent Extraction and Off-Site Disposal of Lead-Contaminated Soils.

Management of Migration (MM) Alternatives --

MM-1: Minimal No-Action.
MM-3: Groundwater Extraction and On-Site Treatment.

Riggs Brook Sediment (SE) Alternatives --

SE-1: Minimal No-Action.
SE-2: Excavation and Off-Site Disposal of Contaminated Sediments.

EPA's Preferred Alternative

In the Proposed Plan issued prior to the public comment period, EPA recommended the following preferred alternatives for addressing the soil, sediment, surface water, and groundwater contamination at the Site. The individual source control (SC), management of migration (MM), and sediment (SE) components of the preferred alternative are briefly described below:

SC Preferred Alternative: On-Site Solvent Extraction of Contaminated On-Site Soils and Sediments. For this alternative, contaminated on-site soils and sediments would be excavated and treated at the Site using a solvent extraction technology. This process would involve the use of solvents to remove the PCBs and other organic chemicals found in the contaminated soils and sediments. The technology concentrates the organics into a liquid which would be destroyed at an approved off-site facility. For this component of the preferred alternative, an estimated 23,500 cubic yards of contaminated soils and sediments exceeding the target cleanup goals established for the Site would require excavation and on-site treatment. Treatment residues exhibiting hazardous waste characteristics would be solidified to the maximum extent practicable while treatment residues continuing to exceed target cleanup levels would be disposed of in a licensed chemical waste landfill.

SC Preferred Alternative: Off-Site Treatment of Contaminated On-Site Surface Waters. For this alternative, EPA proposed to pump between 150,000 and 195,000 gallons of contaminated, on-site surface water from the upper and lower lagoons and the upland marsh located on-site, and transport the contaminated water to a permitted, off-site treatment facility. Culverts and drainage ditches would be installed to reroute the current, on-site drainage patterns toward the southwest, around contaminated areas on the Site, along Route 17. This rerouted drainage would eventually discharge into the west branch of Riggs Brook.

MM Preferred Alternative: Groundwater Extraction and On-Site Treatment with Carbon Adsorption. This alternative would entail construction of one or more deep bedrock extraction wells to collect contaminated groundwater. Collected groundwater would then be pumped through a filter to remove solids and/or oil droplets suspended in the water. Following this preliminary step, the contaminated groundwater would be treated on-site using granular activated carbon which would remove the organic (carbon-containing) contaminants from the water. All treated groundwater would be discharged back into the ground once it achieved the target cleanup goals established for the Site.

SE Preferred Alternative: Minimal No-Action: EPA proposed the minimal no-action alternative to manage the localized areas of PCB contamination within the Riggs Brook sediment. The alternative entailed continuously monitoring Riggs Brook sediments and biota (fish), instituting educational programs for the local community, and not disturbing the currently localized PCB-contaminated sediments through excavation activities.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The Site is a nine-acre portion of land located within a larger 65-acre parcel owned by the F. O'Connor Co. It is located on U.S. Route 17, approximately three miles east of the center of Augusta, Maine.

The property was used as farmland until the F. O'Connor Co. purchased the property in 1952 and established a salvage yard and transformer recycling operations. The handling and dismantling of transformers resulted in oil spills containing PCBs and was the focus of initial sampling efforts by the Maine Department of Environmental Protection (DEP) and EPA. These sampling activities focused on the soils and sediments at the Site, and on surface waters in the lagoons. In September 1983, the Site was added to the National Priorities List (NPL), EPA's list of top priority hazardous waste sites. The listing of this Site made it eligible to receive federal funds for investigation and cleanup under the Superfund program.

The Site is located on the outskirts of the city of Augusta. The population density near the Site includes approximately 50 homes which lie within one-quarter mile of the Site. Currently, there is no extensive development occurring along Route 17 in the area of the Site, however, a new elementary school was recently built approximately one-half mile west of the Site along Route 17. Community interest in Site activities has been low to moderate but sustained among the citizens living near the Site. At the July 1989 public meeting, community concerns focused on future use of the Site, health effects of Site contamination, the extent of Site contamination, and responsibility for the Remedial Design/Remedial Action (RD/RA) phase.

III. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES TO THESE COMMENTS

This responsiveness summary addresses the comments received by EPA concerning the Remedial Investigation (RI) and Feasibility Study (FS) reports, and the Proposed Plan for the O'Connor Co. Superfund site (the "Site") in Augusta, Maine. Two formal sets of written comments were received during the public comment period (which occurred from July 20, 1989 through August 19, 1989): one from a vendor of environmental services and one set from Central Maine Power. Three oral comments were presented at the August 10, 1989 informal public hearing. A copy of the transcript from the public hearing is attached as Exhibit B to this responsiveness summary.

PART A - CITIZEN COMMENTS

The comments received verbally from citizens and in writing from a vendor, and EPA's responses to these comments are summarized below.

Comment 1.

One citizen stated he would like to see the site cleaned up so that the property is useable again; not just filled over.

EPA Response:

The comprehensive, multi-component approach for overall remediation of the Site, as described in the Record of Decision (ROD), will allow for unrestricted use of the Site while, at the same time, providing overall protection of human health and the environment through treatment (to the maximum extent practicable) and, as appropriate, off-site disposal of any residual materials that continue to be hazardous and/or exceed target cleanup levels. Both the State of Maine and Central Maine Power (CMP) expressed the preference, during the public comment period, for off-site disposal of all residuals above target cleanup levels over the creation of an on-site landfill to dispose of these residuals which would require extensive and expensive long-term monitoring and maintenance and limit the Site's usefulness for other purposes.

Comment 2.

One citizen stated that she didn't care how much it cost; she wanted to see the site cleaned up and left the way it was found.

EPA Response:

As discussed above in response to citizen comment 1, the selected remedy for the Site is a comprehensive approach that is protective of human health and the environment and that utilizes treatment, to the maximum extent practicable, which will permanently and significantly reduce the volume, toxicity and mobility of hazardous substances that existed on the Site. Additionally, as is discussed in further detail in response to PRP comments, the selected remedy will achieve these statutory requirements while being cost effective. In evaluating a range of remedial alternatives, EPA is required to consider cost, in addition to technology, reliability, administrative and other concerns, and their relevant effects on public health and welfare and the environment [NCP, 40 CFR Part 300, Section 300.68 (i)]. Therefore, in contrast to the wishes expressed in this comment, cost was considered in selecting the appropriate response action for the Site. Still, as noted in response to Citizen Comment 1, the selected remedy will allow for unrestricted use of the Site.

Comment 3.

One citizen expressed concerns about the PRP's proposal to cover remaining contamination at the Site with 10 inches of soil. These concerns focused on whether someone living in the area could plant trees or do landscaping, which would involve digging down more than 10-inches, without coming into contact with the remaining contamination; and whether the next generation of children could safely play in the area.

EPA Response:

These concerns reflect some of the same uncertainties and potential unacceptable risks which led EPA to reject CMP's proposal in favor of the selected remedy.

Comment 4.

Harmon Environmental Services believes that the physical/chemical stabilization which it demonstrated in its treatability study for E.C. Jordan is superior to solvent extraction, the selected alternative. Harmon also believes that if funding had been provided, it could have demonstrated more aggressive chemical stabilization and substantial reduction in total PCBs, and thereby, meet all relevant response objectives with a soil cover for the stabilized material.

EPA Response:

First, as was indicated in the Proposed Plan issued in July 1989, the treatability study results provided by CMP from Harmon did not appear to demonstrate that solidification is superior to solvent extraction. While the results from the solvent extraction treatability study demonstrated the effectiveness and consistent removal of PCBs from the Site soils tested, the results provided to EPA from the solidification treatability study did not prove that the PCBs had been effectively stabilized. In fact, the results suggest that only a 50% to 75% reduction in the leachability of PCBs was achieved. Furthermore, the available data from other treatability studies using stabilization do not suggest that PCBs can be immobilized.

Secondly, EPA's response objectives included the restoration of the Site to a level that is protective of human health and the environment and that provides long-term permanence. As Harmon indicates in their comment, "Harmon believes physical/chemical stabilization combined with a soil cover (emphasis added) for the stabilized material, will meet all relevant response objectives." EPA believes that this will not meet all objectives since stabilization is not considered a permanent remedy. Furthermore, the integrity of a soil cover (as discussed in the ROD) is uncertain over the long-term.

Finally, the funding provided to Harmon was provided from CMP and not from EPA. If this funding was inadequate to better prove the effectiveness of this technology, then Harmon should have worked this matter out with CMP and, in turn, notified EPA. In fact, EPA suggested to CMP in November 1988, that if CMP wished to pursue a solidification treatability study on its own, CMP was more than welcome to do so. In addition, CMP had ample time in which to do so. In any event, EPA is not persuaded that further expenditures would have shown solidification to have been a more suitable technology than solvent extraction.

PART B - STATE OF MAINE COMMENTS

Comment 1.-- The Management of Migration Alternative

The Maine Department of Environmental Protection (DEP) stated at the public hearing that the State concurs with EPA's selection of the Management of Migration Alternative MM-2: Groundwater Extraction and On-site Treatment with Activated Carbon Absorption, with the understanding that Alternative MM-2 will extract contaminated groundwater, treat the groundwater to comply with federal and state ARARs, and reinject the water into the aquifer. Institutional controls that prohibit the construction and use of any and all groundwater wells within the aquifer must be established until such time as the clean-up objectives are met.

EPA's Response:

DEP's understanding of what the selected management of migration option will entail is consistent with EPA's view of this remedial component. EPA agrees that institutional controls should be established pending the completion of groundwater treatment, and the ROD so provides.

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Comment 2. -- The Source Control Alternative

The DEP conditionally concurs with the proposed Source Control Alternative SC-11A: On-site Solvent Extraction of Contaminated On-site Soils and Sediments with Off-site Treatment of Contaminated On-site Surface Water. As presented, DEP understands that the SC-11A Alternative will consist of the following: (a) all contaminated, on-site surface water from the upper and lower lagoons and the upland marsh will be pumped and transported to a permitted, off-site treatment facility; (b) the on-site barn will be cleaned, demolished and disposed of off-site; (c) all on-site soils and sediments exceeding any of the target clean-up goals of 1 ppm PCBs, 1 ppm cPAHs or 248 ppm lead (approximately 23,500 cy) will be treated by on-site solvent extraction; (d) solid residues from the solvent extraction process that both achieve all EPA target clean-up goals and pass EPA's standard extraction procedure (EP) toxicity tests will be placed back in the excavated areas; and (e) ultimate disposition of solid residues that fail EPA toxicity, fail to meet a clean-up goal or both will be determined following the public comment period.

The DEP understands that one of EPA's options for disposing of the solid residues referred to in point (e) above, is placement back on-site in a stabilized/solidified state or in a RCRA/TSCA landfill. The DEP will not concur with a plan which would include leaving any residues on-site, particularly if it involves creating a RCRA/TSCA landfill within Augusta city limits. A landfill of this nature would require extensive and expensive long-term monitoring and render the site forever useless for any other purpose. The DEP urges EPA to make every attempt to acquire the necessary waivers or treatability variances necessary to allow this material to be disposed of at an existing off-site facility.

EPA Response:

In accordance with the expressed preference of the State and the community, and in the interest of achieving consistency with the overall scope and role of the response action at the Site, EPA has opted to dispose of the residues in question at an off-site facility. This determination is set forth in Section VII of the ROD.

PART C - POTENTIALLY RESPONSIBLE PARTY COMMENTS

EPA received extensive comments from one of the PRPs, Central Maine Power (CMP), during the public comment period. These comments and EPA's responses are set forth below.

Comment 1. -- Overview of CMP's Comments

In all respects except one, the EPA plan and the CMP plan are identical. The one significant difference being the remediation of contaminated soils and sediments. The EPA plan, which calls for excavation of all soils and sediments with greater than 1 ppm PCBs and cPAHs at a cost of approximately $ 12,303,000, is simply not cost-effective. The EPA plan over-estimates the performance of the solvent extraction process, leading to an improper balancing of the reduction of toxicity, mobility or volume factors, implementability factors, and cost factors. The CMP plan calls for the excavation of all soils and sediments with greater than 10 ppm PCBs and cPAHs at a cost of $ 5,882,000, and is therefore more cost-effective. The CMP plan utilizes the same technologies as the EPA plan, is protective of human health and the environment, and can be implemented.

CERCLA and the 1985 NCP require EPA to select a remedy that in a cost-effective manner provides effective protection of human health and the environment. In addition, as provided in the 1988 proposed NCP, the selected remedy should achieve the best balance of trade-offs among alternatives in terms of long-term effectiveness factors; reduction of toxicity, mobility, or volume factors; short-term effectiveness factors; implementability factors; and cost factors. Finally, under the 1988 proposed NCP, EPA must document its selection of a remedy and explain "how the remedy provides overall protectiveness proportional to its costs."

Under these circumstances -- the similarity in effectiveness and implementability and the dramatic difference in the cost to remove an additional 2% of the PCBs from the Site -- CERCLA, the 1985 NCP, and the 1988 proposed NCP require the selection of the CMP alternative.

EPA Response:

EPA disagrees with CMP's interpretation of the law as applied to these facts. In EPA's view, a fair reading of CERCLA and the NCP requires that CMP's remedy be rejected in favor of the selected remedy.

As CMP recognizes, EPA's remedy selection process is governed by CERCLA and the National Contingency Plan (NCP) currently in effect (referred to by CMP as the 1985 NCP). In addition, the Proposed NCP (referred to by CMP as the 1988 NCP) provides a statement of

EPA policy, therefore it does not have the effect of law. Section 121 of CERCLA requires EPA to select a remedy

> "that is protective of human health and the environment, that is cost effective, and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable."

EPA has carried out this mandate of CERCLA in selecting the remedy which is set forth in the O'Connor Co. site Record of Decision (ROD).

The thrust of CMP's comments is that EPA's selected remedy is not cost effective because it costs $6 million more than CMP's proposed alternative, and only buys a little more. EPA disagrees with several of CMP's assumptions. First, EPA believes that the selected remedy buys significantly more than CMP's alternative -- it buys more protection, more permanence, more long-term effectiveness and, of particular importance, compliance with the statutory requirement of treatment to the maximum extent practicable. CMP's alternative does not meet this requirement by virtue of the fact that the selected remedy is an available, practicable option which entails a greater extent of treatment.

Secondly, and following from the fact that the selected remedy accomplishes a better result than CMP's alternative, the selected remedy is cost effective because it achieves a particular result that could not be achieved at a lesser cost. As stated in the Preamble to the Proposed NCP, 53 Fed. Reg. 51422, the cost effectiveness mandate requires EPA "to select protective remedies whose costs are proportionate to their overall effectiveness." CMP's alternative is cheaper but it does not accomplish what needs to be accomplished at the Site. More specifically, it does not meet the target cleanup levels established for the Site in a manner that is permanent, effective over the long term, and that utilizes alternative treatment technologies to the maximum extent practicable. The selected remedy, on the other hand, does accomplish these objectives and it does so economically. At no time has CMP suggested that there is a less expensive way of achieving the same result.

Finally, CMP repeatedly asserts that its proposed remedy would be protective of human health and the environment. As EPA recognized in the FS and further elaborated upon in the ROD, once EPA had the benefit of further input from the community, the United States Department of the Interior and the State of Maine, the ability of CMP's alternative to be protective would depend upon the reliability and long-term maintenance of institutional controls in perpetuity. Whether this eternal condition could forever be satisfied is dubious. In promoting its proposed remedy, CMP suggests that it is just as protective to cover contaminated soils containing up to 10 ppm of PCBs with 10 inches of clean soil as it is to destroy the PCBs through solvent extraction treatment. Not only does common sense dictate that removing and destroying contaminants is more reliable than covering them with dirt, but CERCLA expressly mandates the selection of remedies involving treatment to the maximum extent practicable and states a preference for permanence.

In conclusion, the overall protectiveness of CMP's proposed remedy is questionable as contrasted with the selected remedy which inspires a high degree of confidence. Thus, contrary to CMP's assertion, the cost of the selected remedy _is_ proportionate to its overall protectiveness. The selected remedy is, therefore, cost-effective.

Comment 2. -- Reduction of Toxicity and Effectiveness

CMP states that there is no evidence in the RI/FS to support the claim that solvent extraction can reduce soil toxicity to less than 1 ppm for PCBs. The results of treatability studies conducted on soils from the Site indicated that PCB concentrations could be reduced to below 10 ppm but not necessarily below 1 ppm. By setting the cleanup level at 1 ppm rather than 10 ppm as proposed by CMP, EPA's alternative requires processing approximately 14,500 cubic yards more soil at an increased cost of $6,421,000. Such extensive excavation only results in removal of an additional 2 percent of the PCBs on the Site.

EPA Response:

As CMP admits, it has been demonstrated that solvent extraction treatment will reduce PCB concentrations, at the very least, down to levels below CMP's proposed target level of 10 ppm. It is therefore certain that the selected remedy, which requires treatment until the point at which no further benefit is derived from the treatment process, will destroy more PCBs and better satisfy the reduction of toxicity, mobility and volume criterion than will CMP's alternative.

Furthermore, the treatability study that was performed on contaminated soils from the Site was conducted using three (3) different soil samples with initial PCB concentrations of 760, 3,000, and 15,000 ppm. These high concentrations were specifically selected from the Site because of the three (3) different soil-types that they represented but more importantly, because they represented "worst case" samples chosen to "stress" the solvent extraction technology to the maximum extent practicable. Based upon CMP's own estimates provided in Attachment 1 to their comment letter, the average Site-wide concentration is approximately 280 ppm, and only approximately 1,700 cubic yards out of the 23,500 cubic yards exceeding 1 ppm

PCBs (or about 7%) is estimated to contain PCBs greater than 1,000 ppm. Therefore, the site-specific treatability study results alone do not provide a complete basis for making the statements that a 1 ppm PCB target cleanup level cannot be achieved.

In fact, if CMP had considered information which was available from the vendor it had engaged to perform the original treatability study, CMP would have found that treatability study results using the same solvent extraction technology are available from several other PCB-contaminated sites. These other results, as provided in the Administrative Record and not the RI/FS, show that, for soils containing approximately 20-30 ppm PCBs, a residual PCB concentration of less than 1 ppm can be achieved consistently. Using the estimates in the FS (prepared by CMP) and the information in Attachment 4 to CMP's comment letter, it is estimated that only approximately 20-35% or 4,500-8,100 cubic yards of the total 23,500 cubic yards of contaminated soils/sediments exceeding the 1 ppm target cleanup level on the Site contain PCB concentrations greater than 20-30 ppm. This suggests that 70 to 80% of the total 23,500 cubic yards on the Site will achieve the 1 ppm level.

Comment 3. -- Reliability of EPA's Risk Assessment

The risks posed by the Site were evaluated in the Endangerment Assessment for two different exposure scenarios: current and future use. Both of these scenarios were based on EPA-specified exposure assumptions. Subsequent to the submittal of the Endangerment Assessment (January 1988) and the submittals of the first and second drafts of the FS (June 1988 and November 1988), however, EPA revised the exposure assumptions. CMP questions the assumptions and the methodology used by EPA to calculate the target clean-up level of 3-4 ppm for PCBs for the corresponding risk of 1x10-5 set forth in Appendix B-1f of the FS. CMP also notes that EPA's Revised Assumptions are not universally accepted by the scientific community, and that this frequent revision of assumptions underscores the lack of a sound scientific basis for the assumptions and highlights the arbitrariness of EPA's target PCB clean-up level of 1 ppm.

EPA Response:

CMP is correct in stating that EPA's guidance entitled "Superfund Public Health Evaluation Manual" (October 1986) recommends selecting a remedy which results in a cumulative risk that falls within a range of 10-4 to 10-7 individual lifetime excess cancer risk when an ARAR does not exist for a particular chemical in a particular medium (i.e., PCBs or cPAHs in soil). However, CMP fails to recognize that lifetime refers to 70-years and not the 18-year exposure period from which CMP has consistently been establishing its own target cleanup goals. The inclusion of lifetime exposures accounts for a significant amount of the difference between the CMP-derived 19 ppm PCB target goal at 1X10-5 excess cancer risk and the EPA-derived 3-4 ppm PCB target goal at the same risk level.

Additionally, as the ROD states in Section X, The Selected Remedy, the State of Maine's Department of Human Services-DHS performed a separate assessment of the human health risks posed by the Site. DHS's results using the plausible maximum exposure assumptions taken directly from the Endangerment Assessment (Table 4-5) resulted in a PCB target cleanup level of 0.49 ppm based on a 1X10-5 upper limit cancer risk. Therefore, the State of Maine requested a more stringent target cleanup level for PCBs of 1 ppm for the Site to be protective of human health. The state also noted that this level was consistent with the target cleanup goal established for the Site for the protection of the environment (more specifically, terrestrial wildlife).

Furthermore, it should be noted that the Endangerment Assessment (EA) is used to determine the baseline risks to human health and the environment at a particular site and not to establish target cleanup levels. EPA may properly use other approaches and take into account other considerations in establishing target cleanup levels. Finally, the fact that EPA frequently revises and updates its risk assumptions, if anything, is an indication of the scientific soundness of EPA's rationale for selecting the target cleanup levels for this Site. Scientific knowledge, by its nature, is in a constant state of change. Contrary to what CMP suggests, EPA's frequent revisions of assumptions (which are all taken from the technical literature) is a testimony to the agency's scientific credibility.

Comment 4. -- Protectiveness of CMP's Proposed Alternative

Based on a review of the level of protection provided by the target cleanup goal recommended in the CMP Alternative, 10 ppm PCBs is effective in protecting human and environmental receptors. It should be noted that the CMP Alternative (SC Alternative 11B) proposes to cover any soil or treated residuals containing between 1 and 10 ppm PCBs with 10 inches of clean soil. Thus, under CMP's alternative, the level of PCBs actually available for contact exposure by humans or biota would be less than 1 ppm.

EPA Response:

EPA disagrees with CMP's assertion that soil concentrations of 10 ppm PCBs would be protective of either human health or the environment at the Site. The rationale for EPA's target level of 1 ppm PCBs for the Site soils and sediments is set forth in Section X of the ROD.

With respect to the possibility of contact exposure to the treatment residue containing 1-10 ppm PCBs which CMP proposes to cover with 10 inches of clean soil and leave on the Site, CMP optimistically assumes that these ten inches of soil would never be disturbed. For further discussion of this issue, see Responses to Citizen Comment 3 and CMP Comment 1, and letters from the United States Fish & Wildlife Service regarding target cleanup levels attached to the ROD as Appendix B.

Comment 5. -- Comparison to Other Superfund Sites

In determining the appropriateness of the CMP Plan target cleanup level, EPA must look to its own past decisions. Numerous Records of Decision (RODs) have been issued with cleanup goals of 10 ppm or greater: Ottati and Goss (1987), 20 ppm; Re-Solve (1987), 25 ppm; Belvidere Landfill (1988), 50 ppm; and Sol Lynn (1988), 15 ppm, to name a few examples.

EPA Response:

As stated in the Preamble to the Proposed NCP, 53 FR 51422, EPA recognizes

> "that the solutions that are most appropriate for a given site will vary depending on the size, complexity, and location of the site, the magnitude of the threats posed, the timing of the availability of suitable treatment technologies, and the proximity of human and environmental receptors, among other factors."

Furthermore, as CMP points out in its comments, when no ARARs exist for a particular chemical in a particular medium, such as PCBs or cPAHs in soil, EPA guidance recommends that a remedy be selected which results in cumulative risks that fall within a range of 10-4 to 10-7 individual lifetime excess cancer risks. More specifically, EPA must perform a site-specific Endangerment Assessment for every site which is listed on the National Priorities List (NPL) to identify the magnitude of actual or potential human or environmental exposures, the frequency and duration of these exposures, and the routes by which receptors are exposed. These site-specific assessments of both the current and the reasonable maximum exposure scenarios vary among sites depending on the particular circumstances of each site. Additionally, the state-of-the-art in toxicology has increased dramatically since the issuance of some of these past RODs while, at the same time, the availability of treatment technologies has improved drastically. Finally, at a number of other Superfund sites, EPA has incorporated some degree of land-use restrictions to further protect the human health and the environment from contaminated materials remaining on-site due to the impracticability of more permanent remedial actions.

Comment 6. -- Implementability

EPA's estimate of the degree to which solvent extraction will reduce contaminant concentrations affects the implementability of EPA's alternative. The treatability studies show that after four washings, the contamination in most soils will be reduced to between 1 and 10 ppm. But even after ten washings, the concentrations rarely go to below 1 ppm; most remain between 5 and 10 ppm. Thus, with a cleanup target of 1 ppm, there is uncertainty and unreliability associated with solvent extraction.

EPA Response:

There is virtually no uncertainty or unreliability associated with the selected remedy because any treatment residues with PCB concentrations in excess of 1 ppm will be disposed of in an offsite chemical landfill. Thus, the selected remedy is equal to CMP's alternative with respect to implementability and is superior to CMP's alternative with respect to other criteria, as discussed in the EPA Response to CMP Comment 1.

Comment 7. -- Cost

EPA's alternative is not cost-effective. The RI/FS does not support or justify EPA's decision to excavate and treat 23,500 cubic yards of soil at a cost of $12,303,000 in an effort to reach a target cleanup level of 1 ppm. The cost to remove 97.8 percent of the PCBs is $6 million; an additional $6 million would be required to remove the remaining 2 percent of the PCBs. The 100 percent increase in cost to remove 2 percent of the PCBs is not an appropriate balance of cost versus effectiveness.

EPA Response:

As discussed in greater detail in the EPA Response to CMP Comment 1, the selected remedy is cost-effective because its cost is proportionate to its overall protectiveness.

Comment 8. -- Regulatory Support

Support for the CMP Plan target cleanup level of 10 ppm can be found in the TSCA PCB Spill Policy, 52 Fed. Reg. 10688 (1987). This policy requires the cleanup of spills in nonrestricted access areas to 10 ppm for PCBs to a minimum of 10 inches and the covering of the area with clean soil. Although EPA does not consider the TSCA Spill Policy to be an Applicable or Relevant and Appropriate Requirement (ARAR), the Preamble to the 1988 NCP recognizes it as a federal guidance to be considered. In the absence of an ARAR, this official EPA policy specifically addressing the issue of appropriate levels of cleanup for PCBs becomes of great importance in evaluating protective cleanup levels. Regardless of the future use of the site as restricted or nonrestricted, the Spill Cleanup Policy supports the 10 ppm for PCBs cleanup level.

EPA Response:

The site-specific requirement that a remedy be protective of human health and the environment takes priority over a standard which is "to be considered" (TBC). At this Site, where the protectiveness requirement demands a stricter cleanup level than the TSCA Spill Cleanup TBC, the level which satisfies the protectiveness standard must control. Accordingly, EPA has adopted a PCB cleanup level of 1 ppm. Further, the TSCA Spill Policy specifically states that it applies to spills which occur after May 4, 1987, and that old spills will require site-by-site evaluation. The TSCA Spill Policy also states at Section 761.120(e) that cleanups under CERCLA or RCRA may result in different outcomes.

Comment 9. -- Future Use of Site

EPA, at the public information meeting held July 19, 1989, defended its Plan and the proposed target cleanup level of 1 ppm on the basis of the need to allow residential use of the site. There is no statute, regulation or policy that requires a Superfund site to be remediated such that it can be used as residential property or even returned to its original condition. In addition, there is nothing unusual in the use of institutional controls to restrict access to a site under the Superfund program as proposed in the CMP Alternative. The site is located in a rural area and there is no evidence in the record that the area is experiencing any residential development pressure. In addition, it is unlikely that any financial institution would accept the risks inherent in financing residential development of the site. The site's history, the fact that groundwater treatment will continue for 27 years, and the high risk inherent on foreclosure, render it unlikely that the site will be developed. Thus, EPA's future residential use scenario is impractical, unreasonable, and unrealistic as well as legally unsupportable.

EPA Response:

As emphasized throughout these responses, Section 121 of CERCLA requires EPA to select a remedy that is protective of human health and the environment and that uses permanent solutions and alternative treatment technologies to the maximum extent practicable. Protection of human health necessarily involves a consideration of the likely uses of a site. In this case, not only is the Site within the city limits of the state capitol of Maine, but citizens have also expressly testified that their children played on the Site (*see* Transcript, Public Meeting of August 10, 1989, Augusta, Maine) and it is reasonable to assume that more children will do so in the future.

In addition, as set forth in the ROD, EPA has established target cleanup levels for contaminants of concern in site soils, sediments, groundwater and surface waters based on protection of human health and the environment. CMP proposes to achieve the cleanup levels in part by covering contaminated soils and sediments with 10" of clean soil and imposing institutional controls. Not only does this raise questions about the capacity of CMP's alternative to be protective, but this reliance on institutional controls would clearly result in a remedy that was less permanent and less effective over the long haul and that would not make use of alternative treatment technologies to the maximum extent practicable. While the use of institutional controls may be an appropriate component of some Superfund remedies, there is no need or justification for reliance on such controls under the circumstances at this Site.

Comment 10. -- Five-year Review

CERCLA requires reviews, at least every five years, at sites where the remedial action leaves hazardous substances, pollutants, or contaminants onsite. The EPA Alternative calls for such a review. According to the NCP (1988), a five-year review is required at sites where substances remain above levels that allow for unrestricted use. If a 1 ppm cleanup level is implemented and the site is safe for unrestricted use, then a five-year review is not required.

EPA Response:

As CMP recognizes, Section 121(c) of CERCLA requires a review of any

> "remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site ... no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented." (Emphasis added.)

Thus, the so-called five-year review is a minimum requirement under the statue. The proposed NCP which CMP cites, offers an interpretation of this minimum requirement and goes on to state, "In addition to the statutorily required five-year reviews, EPA might specify in its record of decision more frequent reviews, or specific reviews of the remedy selected..." 53 FR 51430. In this case, where a relatively new technology is being used to treat the on-site soils and sediments, where groundwater treatment is expected to take from 20 to 30 years, where a minimum-no action approach to the sediments in Riggs Brook has been adopted, where the Site is within the Augusta city limits, where children are known to have played at the Site in the past and are likely to do so in the future, and where monitoring is easily accomplished, EPA is acting well within its statutory authority in requiring a five-year review to ensure that the selected remedy is protective.

Comment 11. -- Compensatory Wetlands

EPA has requested comments on its proposal establishing compensatory wetlands because of the impact on the site caused by destruction of the existing lagoons and upland marsh. CMP opposes this proposal. The lagoons and upland marsh are not "natural" resources. The lagoons were created as a result of DEP interim remedial action at the site in 1976 to collect and contain oil run-off. The upland marshes were a side effect of this remedial effort. Thus, federal policies aimed at preserving wetlands, restoring contaminated areas to their natural condition, and protecting existing, thriving ecosystems are inappropriate.

EPA Response:

First, it should be recognized that the Wetlands Executive Order, E.O. 11990 is not merely a statement of policy, as CMP suggests, but rather is a binding directive with which EPA must comply. Secondly, there is no need to speculate about what this Order or the regulations which relate to its enforcement (Procedures for Implementing the Requirements of the Council on Environmental Quality on the National Environmental Policy Act, 40 C.F.R. Part 6) are "aimed at," because the scope of their coverage is unambiguous. In defining the term "wetlands," neither the executive order nor the federal regulations cited distinguish between man-made and naturally occurring bodies of water. Thus, regardless of their origin, wetlands are entitled to the protection afforded by these provisions. The definitions cited by CMP, 43 C.F.R. § 11.14, are not on point.

Comment 12. -- Solidification Process

Although the on-site solidification alternative is not being recommended by CMP or EPA as the proposed alternative for remediation, the solidification process is being proposed for treatment of lead-contaminated soil in both the CMP and EPA plans. CMP thus feels it necessary to clarify certain statements made by EPA about the alternative.

1. The proposed treatment will not occur in on-site mobile units, as described in the June 1989 FS, but will occur by processing contaminated soils on-site by spreading soils and additives on the ground and mixing them with a tractor containing a paddlewheel mixing device.

2. EPA quoted the O'Connor Solidification/Stabilization Treatability Study out of context. The EPA Proposed Plan, July 1989, states: "The recently completed

bench-scale treatability study ... suggests the PCBs may not have been chemically stabilized successfully, and that only a 50 percent to 75 percent reduction in PCB leachability was attained." The total-waste extraction test performed as part of the treatability study did indicate that PCBs may not be chemically stabilized. However, EPA did not cite the results of the physical stabilization tests in the analysis, even though the explanation of this technology states that it "uses a combination of physical and chemical stabilization processes to bind contaminants..." Individual leachate tests conducted under the treatability study were conducted under rigorous sample preparation techniques (grinding, sieving) untypical of field conditions and no "binding" proprietary additive was used to further stabilize PCBs. Even under those conditions, the study results still indicated successful solidification/stabilization of PCBs, cPAHs, and lead at the O'Connor site.

EPA Response:

EPA acknowledges its error in the Proposed Plan regarding the description of the solidification alternative, and EPA has made the appropriate corrections to the ROD for alternative SC-6.

The second part of the above comment has been addressed separately under Part A of this Responsiveness Summary regarding comments made by Harmon Environmental Services. Furthermore, it is EPA's understanding that the leaching protocols used during the solidification treatability study are the same ones accepted by EPA under the SITE demonstration program. Finally, it is EPA's understanding that E.C. Jordan contacted EPA staff personnel with expertise in solidification under the SITE program, and that the leaching procedures used were agreed upon by all parties.

Comment 13. -- Riggs Brook

CMP concurs with EPA's proposal to implement minimal no-action for Riggs Brook sediments.

EPA Response:

No response called for.

Comment 14. -- Disposal of Residuals

CMP concurs with the DEP preference that all residuals above target clean-up levels be disposed of off-site.

EPA Response:
No response called for.

IV. REMAINING CONCERNS

During the public informational meeting on the Proposed Plan held by EPA in Augusta on July 19, 1989, and at the informal public hearing held on August 10, 1989, local residents discussed issues that may continue to be of concern during the design and implementation of EPA's selected remedy for Site.

Future Use of Site

Citizens expressed concern about whether the site would be useable again. They would like to see it returned to its original condition.

EPA Response:

See the EPA Response to Citizen Comments 1,2 and 3.

Health Effects

Citizens expressed concern about the health effects of the site. They feel that the seemingly high rate of cancer affecting persons living near the Site could be related to Site contamination.

EPA Response:

As set forth in the ROD and reiterated throughout this Responsiveness Summary, EPA selected a remedy that it has determined to be protective of human health and the environment. Furthermore, EPA contacted the Agency for Toxic Substances and Disease Registry (ATSDR) following the two (2) public meetings held on the Proposed Plan in response to concerns raised by members of the public. ATSDR personnel indicated that they would speak with local citizens near the Site about their past and future health concerns relative to the Site. As of the issuance of this ROD, ATSDR personnel visited two (2) of the citizens who had expressed these concerns, and will conduct further inquiries following discussions with the State of Maine, Department of Human Services.

EXHIBIT B

UNITED STATES OF AMERICA

Environmental Protection Agency

In Re:]
E.P.A. Region I Superfund Program]
O'Connor Company Site]
Augusta, Maine]

Hearing before the United States Environmental Protection Agency, Region I, on August 10, 1989, at the American Legion Post number 205, 400 Eastern Avenue, Augusta, Maine, commencing at 7:42 P.M.

PRESENT:

Frank Ciavattieri, E.P.A., Region I, Chairman
Michael Jasinski, E.P.A., Region I
David Webster, E.P.A.
Alan Prysunka, Maine D.E.P.
Thomas Benn, Maine D.E.P.
Cynthia Coombs, Maine D.E.P.

William R. Pieske, Shorthand Reporter

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MR. CIAVATTIERI: Good evening, ladies and gentlemen, and I guess I should add young lady. I would like to welcome you here tonight for the public hearing on the O'Connor superfund site. My name is Frank Ciavattieri. I am from the United States Environmental Protection Agency in Region I which is in Boston, and my position with E.P.A. is the branch chief for the Maine and Vermont waste management branch. Part of my responsibility includes overseeing implementation of the remedial superfund program within the State of Maine.

I'd like now to introduce the people at the head table with me here tonight. On my right is Michael Jasinski who is the remedial project manner from E.P.A. for the O'Connor site. To his right is David Webster who is the section chief for the United States Environmental Protection Agency for the Maine and Vermont superfund section. To his right is Alan Prysunka who is the director of the Bureau of Oil and Hazardous Materials Control for the State of Maine. To his right is Thomas Benn and to his right is Cynthia Coombs who are site managers from the Maine Department of Environmental Protection. To their right is Dick Christian who is with Camp, Dresser and McKee who is E.P.A.'s oversight contractor for the O'Connor site.

I will serve as chairman for the hearing tonight and want to welcome all of you here. The purpose of tonight's hearing is to formally accept your comments on the remedial investigation, endangerment assessment, feasibility study and proposed plan for remediation at the O'Connor superfund site located on Route 17 in Augusta, Maine.

The E.P.A. will also accept your comments tonight on the issues stated in the proposed plan on page 27 regarding the final location for disposal of treatment residues which may not achieve the target cleanup goals which have been established for the site and as well as the issue of the compensatory wetlands described on page 14 of the proposed plan. Copies of the proposed plan are available if you didn't get one as you came in at the front door.

Before I begin the formal part of the evening's proceedings, I would like to describe to you the format of this hearing. Essentially, the evening will be structured into four parts. First, Michael Jasinski, the remedial project manager from E.P.A., will give you a brief overview of the site contamination in E.P.A.'s proposed plan.

As many you of you know, E.P.A. and D.E.P. representatives made a detailed presentation of the site contamination and the proposed plan at a public informational meeting which was held here on July 19th. Following Mike's overview, Al Prysunka of the Maine D.E.P. will make a statement for the record on behalf of the State of Maine.

After these opening statements, we will open up the formal part of the hearing to any other oral comments that those of you in the audience tonight may wish to make for the record. Those of you who wish to comment tonight should indicate your desire to do so at that time by raising your hand. At that time I will ask any of you who wish to comment to identify yourself and your association with the O'Connor site. As I call upon you to make your statements or comments for the record, I would kindly ask that you come to the front of the room so everybody can hear you when you speak and our recorder can also hear you. I will reserve the right to limit each oral comment to ten minutes. Although we do not expect this to be a problem in terms of time, I may have to impose that restriction. If I have to impose that restriction, I will ask you to summarize your most important points you make and ask you to provide E.P.A. with a full copy text of your comments either at the end of tonight's hearing or prior to the close of the public comment period which ends on August 19th. Please note that the entire context of this hearing is being transcribed and will become part of the record for the site.

After you have made your comments, I or another member of this panel may ask you some clarifying questions to assist us in considering more fully -- and more fully addressing your statements for the record. After all the comments have been heard, I will close the formal part of this hearing. Just to remind you, the purpose of tonight's hearing is to receive your comments for the record. As part of the formal hearing, we will not be able to respond to your comments or questions when asked. However, after the close of the formal part of the hearing, we will remain available informally to answer your questions on any of the issues raised during the evening or any other aspects of the feasibility study or proposed plan.

As many of you already know, the public comment period for the proposed plan began on July 20th and runs through August 19th. If you wish to submit written comments, I encourage you to do so. They must be postmarked no later than Saturday, August 19, and mailed to E.P.A.'s office in Boston. The appropriate address of our office can be found on page two of the proposed plan. Additional copies of the proposed plan are available on the table at the front of the room.

At the conclusion of the meeting tonight, please see one of us from E.P.A. if you have further questions on the process for making written comments. Any oral comment we receive tonight during the formal part of this hearing and those we receive in writing during the comment period will be responded to in a document we call the responsiveness summary. This summary will be included with a decision document or record of decision -- R-O-D we call it -- that E.P.A. prepares at the conclusion of the comment period. In the record of decision, E.P.A. will explain which cleanup alternative or alternatives have been selected for the O'Connor site.

I realize I have presented a lot of information to you in these opening comments. Are there any questions on how we are going to proceed this evening?

(No response)

MR. CIAVATTIERI: Okay. I again want to thank you for coming here and encourage you to express any comments or questions you have during the proper time during the presentations tonight. At this point I would like to turn the proceedings over to Mike Jasinski who will provide you with a brief overview of the site and the proposed plan which is now up for public comment. Michael?

MR. JASINSKI: Thank you, Frank. What I would like to try to do real quickly is summarize some of the information that was presented at the public information meeting relative to the site contamination and the distribution of contaminants found during the field efforts. Just quickly, this site -- and this is in a packet that is available at the front of the room. Basically, the site, again, is located about a mile southeast of Augusta, Maine, on Route 17 on Eastern Avenue. The contaminated portion of the site is nine acres of a total property acreage of 65. Most of the activity that resulted in the contamination at the site was due to transformer spillage of contaminated PCB oils, and this operation occurred mainly between the fifties and 1978.

On this overhead you can see the key areas of the site, principal site features. The site, basically the nine acres, is surrounded by the fence as shown there. The key site features include the large barn which you may have noticed on your drive down Route 17 this evening. Several of the transformer work areas where most of the transformer dismantling and most of the spillage occurred were in what is called transformer work area one which is closer to the barn. Transformer work area two and transformer work area three.

There are two on-site lagoons, an upper and lower lagoon, that were specifically constructed in the early seventies at the request of the Department of Environmental Protection. Some of the sediments that were dredged from the upper lagoon were placed in an area we designate as the low area which, in turn, has created what we call the upland marsh.

Key contaminants identified during the field investigation were PCB's. This overhead tries to depict to you the area of distribution of PCB's at the one part per million range. The fence in green and the border cross-hatched showing the aerial distribution of one part per million PCB's which is in your handout, and inside these areas are lowered levels or depth determinations of ten feet and eight feet where the transformer work areas primarily were; transformer work area one here and transformer work area two here.

One other key contaminant during the remedial investigation was polycyclic aromatic hydrocarbons; more from a cancer perspective, carcinogenic PAH's, as they are called, shown in this area with a blue line indicating for that area it is over one part per million of cPAH's; all, again, within the nine-acre fence.

Lastly, one other key contaminant of concern in soils is lead. In this overhead I tried to show to you where the areas are that are greater than 248 parts per million in lead highlighted by these darker areas. Areas surrounding that are at concentrations a little bit lower; the outer reach being about a hundred parts per million. Again, within the nine-acre fence area and all of which of these three compounds, if you were to put these over each other on an overhead, would show that they were very well distributed in a very co-located area of the site.

Based on the contamination determined at the site during the field investigation and the risks to the public health and the environment, E.P.A. and Central Maine Power and their contractor evaluated several alternatives for remediating the site. For the soil and sediment contamination within the areas I have shown you, several of the alternatives that were reviewed in detail were minimal no-action, on-site capping, on-site construction of a landfill, off-site disposal at an existing landfill, on-site incineration, on-site solidification, on-site vitrification, on-site dechlorination and two subcomponents of a solvent extraction technology on the site.

Some of the other contaminants of concern were in groundwater; mainly, again, PCB's and, to a lesser extent, benzene and 1,4-dichlorobenzene. In evaluating the alternatives for that, two of the alternatives evaluated in the feasibility study were minimal no-action and an active extraction and treatment system for the groundwater using activated carbon.

One other area of concern that I didn't show in any of the overheads was Riggs Brook. In Riggs Brook, during the field investigations, slightly less than five parts per million PCB's were found in a very localized area of Riggs Brook near the site, which is primarily a wetland area along the near reaches of the site. To evaluate the alternatives to address the sediment contamination in Riggs Brook which contained PCB's less than five parts per million, we looked at minimal no-action again and excavation and off-site disposal of the sediments. Through the evaluation of these alternatives for each of the contaminated media -- that is, soil and the surface waters, groundwater and the sediments in Riggs Brook, the preferred alternative at the present time for public comment that E.P.A. is recommending for the site includes the following -- these are as specifically stated on page 11 in the proposed plan.

Essentially, the preferred alternative to address the contaminated soils and sediments and surface water on the site involves the following: Excavation of all the contaminated materials on the site containing one part per million PCB's, one part per million cPAH's or carcinogenic polycyclic aromatic hydrocarbons and 248 parts per million lead. Those soils, all of which involve approximately 23,500 cubic yards, would enter a treatment system as I showed you previously that was evaluated, which is on-site solvent extraction. The on-site solvent extraction, essentially, is a process which adds a solvent to the contaminated soil. It extracts the contaminants -- mainly the organic contaminants, not the lead -- and takes that contaminated liquid and treats it in a different location. In this case, that material or concentrated liquid containing primarily PCB's and the PAH's would be treated at an off-site incinerator located outside of Maine. Typically those units are in Deer Park, Texas, and Chicago, Illinois. Another one is in Pittsfield, Massachusetts.

The next step in the process which would involve disposal of the solid residues if they do not achieve our target cleanup levels as stated up here, which are one ppm PCB's and one ppm cPAH's and 248 lead, would be disposed of with further treatment. Now, we are in public comment on what that eventually would be, and that could potentially be at the present time an on-site location which would probably include a landfill or the potential for taking that contaminated material off-site and disposing of it in a properly fashioned landfill that exists already. What we estimate at the present time of the 23,500 cubic yards that would enter the solvent extraction unit, that approximately 5,000 cubic yards of that would have to enter into the disposal option we present here and would probably enter into some of the further treatment that we would consider as stabilization and fixation mainly due to the lead.

The lagoon on-site contain approximately 150,000 to 195,000 gallons of contaminated surface water and contaminated sediments. We would enter into pumping the contaminated groundwater -- excuse me, surface water out of the lagoons and treating it in an off-site facility. The sediment, in turn, that exceeds the levels shown up here would then, in turn, undergo the voluntary solvent extraction process. These lagoons are considered wetlands on the site. One item that is in the proposed plan is to provide for compensatory wetlands; that is, to construct wetlands comparable to those in an area of the property that would be roughly about a half an acre.

Just briefly, to show you a schematic of the on-site solvent extraction process, as I mentioned, the materials would be excavated, enter a reaction chamber which could run between 25 cubic yards to a hundred cubic yards in size. The solvent would be added. What comes off the reaction chamber would be the concentrated liquid of organic PCB's and PAH's. That would be taken off-site for incineration. Clean soil and sediment that come from the reaction chamber after so many washes, as it is called, would be put back on the site if it achieves our cleanup levels. Those that do not, as I mentioned, would undergo further treatment and disposal either on-site or off-site.

For the contaminated groundwater on the site, we are presently preferring the treatment -- pumping and treatment option as proposed versus the minimal no-action which would include deep extraction wells on the site, an on-site treatment unit containing carbon absorption and recharging that groundwater on the site either through recharged wells or recharged trenches if they achieve our cleanup goals for the groundwater as shown here. A simplistic schematic of that shows the pumping of the groundwater to a pretreated filter for particulates that could be a potential hindrance to the further treatment using the more important activated carbon unit. That carbon as filtered would go off-site for treatment, if necessary, due to contaminants plugging the systems and not achieving our goals.

Finally, as I mentioned Riggs Brook, the less than five parts per million of sediment in there that's about 900 cubic yards -- that's greater than about one part per million -- would undergo the minimal no-action alternative which basically involves an extensive monitoring of the sediments and the biota and instituting some educational programs to inform the public of how the site contaminations is proceeding as far as the cleanup and the remedy and how our extensive monitoring results change based on what we know today. Essentially, that is all I have to say, and I would like to turn it back over to Frank.

MR. CIAVATTIERI: Thank you, Mike. At this time I would like to recognize Mr. Alan Prysunka from the Maine Department of Environmental Protection to make a presentation on behalf of the State. Al?

MR. PRYSUNKA: My name is Al Prysunka, and I am the director of the Bureau of Oil and Hazardous Materials Control within the Maine Department of Environmental Protection. I will be presenting the testimony on behalf of Dean C. Marriott, Commissioner of the Maine Department of Environmental Protection concerning E.P.A.'s proposed plan for remediation of the F. O'Connor site. The Maine Department of Environmental Protection has reviewed the draft remedial investigation and feasibility study for the F. O'Connor site and offers the following comments on the U.S. E.P.A.'s proposed plan for site remediation which includes both management of migration for groundwater and source control alternatives.

The D.E.P. concurs with the management of migration alternative two which is groundwater extraction and on-site treatment with activated carbon absorption as proposed by E.P.A. The D.E.P. understands that the management of migration alternative will extract contaminated ground water, treat the groundwater to comply with Federal and State applicable or relevant and appropriate requirements, commonly known as ARARS, and reinject the water into the aquifer. Institutional controls which prohibit the construction and use of any and all groundwater wells within the aquifer must be established until such time as the cleanup objections are met.

The D.E.P. conditionally concurs with the proposed source control, alternative SC-11A, which is on-site solvent extraction of contaminated on-site soils and sediments with off-site treatment of contaminated on-site surface water. As presented, the D.E.P. understands the SC-11A alternative will consist of the following:

A, All contaminated on-site surface water from the upper and lower lagoons and the upland marsh will be pumped and transported to a permitted off-site treatment facility.

B, the on-site barn will be cleaned, demolished and disposed of off-site.

C, all on-site soils and sediments exceeding any of the target cleanup goals of one part per million polychlorinated biphenyls, one part per million for the carcinogenic polycyclic aromatic hydrocarbons or 248 parts per million of lead which will be about approximately 23,500 cubic yards will be treated by on-site solvent extraction.

D, solid residues from the solvent extraction process that both achieve all E.P.A. target cleanup goals and pass E.P.A.'s standard extraction procedure toxicity tests will be placed back in the excavated areas and,

E, ultimate disposition of solid residues that fail EP toxicity, fail to meet a cleanup goal or both will be determined following the public comment period.

The D.E.P. understands that one of E.P.A.'s options for disposing of solid residues is placement back on site in a stabilized solidified site or in a RCRA/TSCA landfill.

The D.E.P. will not concur with a plan which would include leaving any residues on-site, particularly if that involves creating a RCRA/TSCA landfill within the Augusta city limits. A landfill of this nature would require extensive and expensive long-term monitoring and maintenance and render the site forever useless for any other purpose.

The D.E.P. urges E.P.A. to make every attempt to acquire the necessary waivers or treatability variances necessary to allow this material to be disposed of at an existing off-site facility. Thank you.

MR. CIAVATTIERI: Thank you, Al. We will now take comments regarding the proposed plan and studies conducted at the O'Connor superfund site. I have a request from Central Maine Power to make a ten-minute presentation. Mr. Andrew Towt of Central Maine Power?

MR. TOWT: Yes and speaking with me independently at the time is James Wallace of E.C. Jordan Company, our consultant. May we begin? Good evening. My name is Andrew Towt. I am Central Maine Power Company's project manager for the O'Connor site.

Speaking with me tonight will be James Wallace of E.C. Jordan Company who is our consultant for this site. The purpose of our presentation is to highlight some aspects of both of the proposed cleanup plans. This was the cleanup plan proposed by the E.P.A. and the cleanup plan which is proposed by Central Maine Power Company. We will also be submitting written comments for the record before the close of the record on the 19th.

Central Maine Power Company has been involved with this site since 1984 when E.P.A. informed both us and the O'Connors that we may be responsible for environmental problems which were being found at the site. Our effort has been twofold. The first was to address any immediate problem which the site posed to human health and the environment. Our efforts here were in three parts. We constructed a fence which surrounded the site which prevented anybody from gaining access to the site. We removed tanks and barrels which were used to store oils at the site and we removed scrap metals which were located in the northwest corner of the site which were seen to pose a safety risk to anybody in and around the area.

The second part of our effort was to become involved with the design of the studies which were to be performed at this site. We gave input to both the Maine Department of Environmental Protection and the E.P.A. on what we thought were the both means to design -- excuse me, the best means to perform these studies and then we managed the studies and paid for the studies. The conclusion of all this effort was the design and submission of our cleanup proposal to the E.P.A. and the Maine D.E.P.

As Mr. Wallace's presentation will detail, our plan is very similar to E.P.A.'s, and we feel that both our plan and E.P.A.'s plan can both be implemented and are both protective of human health and the environment. However, we are very confident that our plan is in everyone's best interest and will meet all the cleanup projections.

Before I turn the floor over to Jim, I would like to make a note about the compensatory wetlands which have been raised. I think it is important to note that the wetlands being discussed here are not the wetlands which are part of the Riggs Brook aquifer system which everyone sees as you drive up Route 17. These are a -- this is a swamp, marsh area which is located on the upper part or the back part of the site. This swampy area was created actually by a remedial effort which was undertaken by the D.E.P. in the late seventies.

The swamp was created when the effort resulted in the backup of water into that area and because of that backup of water, certain wetland vegetation and animals were allowed to grow and proliferate at the site. Although CMP has not taken a position yet on how to address the rebuilding of these wetlands, we think it is important to note that these were not a natural part of the site or a part of the terrain of the area before the first cleanup effort was undertaken. Now I would like to give the floor to Jim.

MR. WALLACE: Thank you. My name is Jim Wallace. I work for C.E. Environmental, formerly known in Maine and in other places as E [illegible]. Jordan; purchased about two years ago and then before the name changed.

As I mentioned, we have been working as a consultant with Central Maine Power for approximately four or five years, and during this time there has been a lot of interaction between Central Maine Power and the agencies before you. Documents have gone back and forth, work plans have gone back and forth. There have been numerous meetings where consultants have been available. We discussed technical issues, and, in general, the proposed plan as put forth by E.P.A. and D.E.P. for this site as well as the proposed plan put forth by Central Maine Power are very similar in most aspects.

What I would like to focus on a little bit here tonight are where these two plans differ slightly, and it is in the area dealing with the surface soils, those soils that are contaminated with the PCB's, the PAH's and the lead, as mentioned earlier and so to concentrate just on the surface soils because everything else we are in agreement on.

Under the Central Maine Power plan, the target level will be to excavate all of those surface soils and all the soils that contain ten parts per million of PCB's or greater. I am going to concentrate just on PCB's, although there are PAH's and lead because as was mentioned earlier, these contaminants are co-disposed on the site. They are in the same place. So if you deal with the PCB's, you will take along with it the PAH's and the lead. So we will just talk about PCB numbers for simplicity.

(Indicating on visual aid) Under the CMP plan, to excavate to ten part per million for the solvent extraction process. Under the E.P.A. plan, excavate to one part per million and then subject it to the solvent extraction process, the major difference here being this is the 23,000 cubic yards you heard about earlier. This represents a volume of approximately 9,000 cubic yards. Treat with solvent extraction under the CMP plan; treat with solvent extraction under the E.P.A. plan. It is the same process. The same machinery would be on-site subjected to the same number of cycles, et cetera. So the technical process of extracting the PCB's and the PAH's from the soil will be the same under both plans.

Under the CMP plan, to recover -- to cover all soils that come out of the process that sit in the range of one to ten parts per million with at least ten inches of clean soil and leave them on the site. Under the E.P.A. plan it calls for dealing with the soils that come out of the treatment process that are greater than one part per million and dealing with them either with an on-site landfill, a secured landfill, an engineered facility or putting them into trucks, driving them down the road and transporting them to a licensed facility somewhere else.

I would like to focus on three key words as we go through the next couple of minutes, and they are effectiveness, implementability and cost, and these come right out of the regulations and are primary criteria for evaluating alternatives and remedies at the site. Effectiveness is protection. How well do we protect things against the hazards that are on the site. Implementability is a large word that says can we do it. Can we go out and do what we are proposing to do; and cost, of course, relates to the dollars that are associated with the proposed plans.

What do we want to protect? We want to protect human health, and we want to protect wildlife. These are the two things we want to protect at the site; and in protecting human health and wildlife, we need to look at the method by which humans and wildlife will be exposed to and subjected to the effects of the PCB's on the site; and with respect to the soils, we are dealing primarily with the contact; contact with the skin, absorption through the skin, eating dirt either through children or the animals; that type of a contact. Breathing it, it is not respirable dust. So it is a contact problem with those things that are at the surface, both for the humans and for the wildlife.

We feel that the CMP plan provides an adequate level of protection for human health and for wildlife in respect to those pathways and essentially is equivalent to the level of protection provided by the E.P.A. plan. Under the E.P.A. plan what will be available on the site when remediation is done are PCB concentrations of one part per million or less at the surface. Under the CMP plan, what will be available to humans and wildlife at the site after remediation is done will be one part per million PCB's at the surface. Anything that is greater than that will be under at least ten inches of soil with a vegetative cover of soil over it.

I have just put up here some recent decisions -- not recent; some within a couple of years but some decisions on PCB sites; and the reason I have selected these are they are PCB sites. They are in the Northeast. Two are in New England. One is in upstate New York and these are sites where E.P.A. has decided through the record of decision process what the acceptable target cleanup level is for protection of human health and wildlife on these sites and has signed off on them. The target cleanup level on the Otati and Goss in New Hampshire is 20 parts per million for protection of human health and the environment. For the Resolve site that is down in southeastern Massachusetts down near the New Bedford area, a rural area site, not all that dissimilar from the site we have here, for protection of human health and the environment, 25 parties per million; and the Wide Beach, New York, site, which I understand is in a residential area -- there are front yards, grass; they are going to roll back the turf, dig up the soil, put it back -- for the protection of human health and the environment, the E.P.A. has decided ten parts per million are adequate for protection.

Can we do it? We can go out to the site, and we can dig up the dirt. We are going to dig up the dirt under both plans, the E.P.A. plan and the CMP plan. It is a dirt-moving operation. Under the CMP plan, we need to move 9,000 yards, approximately. Under the E.P.A. plan, we need to move approximately 23,000 yards. It will take us a little bit longer, or we will need to have more machines on-site to do the E.P.A. plan, but they are both implementable. We can do both of them. They can be done. We did some studies on the soils. We took specific site soils that were contaminated with PCB's, subjected them to test to determine if the solvent extraction process could, in fact, take the PCB's off of the soil and get it into the extract. Can we do it? The answers that came back from those treatability studies are contained in the reports; and basically, they show yes, we can do it.

One thing that they show, however, is that there is a good degree of certainty that we can remove the PCB's off of the soil to less than ten parts per million. They do not show that we can remove the PCB's off of the soil to less than one part per million.

That is an important point to consider and has ramifications on what happens to the soil that comes out the end of the process.

Speaking about those soils that come out the end of the process, can we cover them on-site, put down ten inches of cover material, seed it on top and maintain it so that it will not erode away and will not become available at the surface? Yes, we can. Can we build an engineered facility on that site, double liner, put the wastes in, put a cap on it, put a cover material on the cap and ensure that that will stay intact? Yes, that can be done. Can we put it in trucks and drive it away? Yes, we can do that. So both the CMP plan and the E.P.A. plan, we can do them. They are implementable.

The third thing I would like to focus on is cost. Now, if you look at the cost of the CMP plan which uses approximately 9,000 cubic yards of soil that need to be treated, the estimated cost for the total cleanup -- that is all of the media and everything -- is in the order of 6 million dollars. When you look at the E.P.A. plan with approximately 23,000 cubic yards of soil that need to be treated and then disposed of, it is an approximate total cost of 13 million dollars; and as was mentioned by a previous speaker, is 13 million dollars -- one of the assumptions that goes into that is that approximately 5,000 yards out of this 23,000 cubic yards is what will need to be disposed of either in an on-site landfill or trucking to another facility. When you look at the results of that test that we did to see if we could do the process, it suggests -- it does not support the fact that this number will be 5,000. In fact, it supports the fact that the number might be closer to 23,000 yards that we might have to deal with when we are done with the treatment process. We don't know the exact number. We will only know when we get into it, but that would suggest this 13 million dollars could grow and could grow substantially if, in fact, this process does not get down to one part per million.

As I mentioned earlier the results of the treatability study suggests we can get it below ten parts per million. They do not suggest we can get it below one part per million. So to summarize what we have talked about, the CMP plan and the E.P.A. plan offer essentially equivalent levels of protection for human health and the environment. Can we do them? We can do both of them, and what is the cost? Approximately 6 million dollars for the CMP plan; 13 million dollars maybe plus for the E.P.A. plan. Thank you very much.

MR. CIAVATTIERI: Thank you. Do we have any other members of the audience tonight here who would like to make a statement for the record? Sir, would you please stand up, identify yourself?

MR. IRISH: I am Harold Irish. I live on the Cony Road up here, and I didn't plan on speaking tonight, so I have no notes. I am here as a concerned person because I moved in this area in 1965. I moved on the Cony Road. At that time O'Connor junkyard was in the process of operation as well as the Central Maine transformers and so forth. The reason I am really concerned, I don't know the mechanics of what the E.P.A. is going to do or Central Maine. I don't know which is the best way to go about -- solvents or removal but I am concerned as living close by here, I would like to see the piece of property to be usable again.

It concerns me a little. I don't hold Central Maine Power liable for anything myself. I lost a son in 1972 to leukemia, and he played in this place over here. I am not saying he got it from there, but since that time, we have lost eight other people on the Cony Road where I live. This is kind of scary, and this is just in this area. So my neighbors on both sides of me have gone. I am not saying this is what is causing that, but myself, I would like to see it cleaned up; not just filled over.

I am a landscaper in charge of the veterans' cemetery. It kind of scares me what I just heard a few minutes ago. Maybe it will work, but ten inches of soil over the top of this, can someone live there and go out and plant a tree? Can they dig down more than ten inches without coming into this bad stuff? I am just concerned the kids are going to be playing around here; not my kids but my grandchildren and those who live on my street and runs around in the field here. I would like to see this piece of property back where it belongs. I am very concerned with my friend who would be lost. I guess that was mainly what I have got to say. I would like to see it cleaned up.

MR. CIAVATTIERI: Thank you. Do we have any other commenters? Yes.

MRS. IRISH: When I come to meeting last week or last month, I said that I didn't think -- I think Central Maine Power Company is a good company. I have met different people that work there. I think they are very well represented and O'Connors' junkyard -- and I am quite sure they knew what they were doing when they put those transformers there -- I hope, and I have to believe this, that they didn't realize the danger they were putting this neighborhood in. Now I say this is the way I look at it. I brought up six children. If you make a mess, cleanup the mess, and that is what I say to Central Maine Power Company. I don't care how much it costs you or O'Connor junkyard. Leave it like you found -- you know, you went in and you messed it up. Now, for God's sake, clean it up. That is all I have got to say.

MR. CIAVATTIERI: Would you identify yourself, please?

MRS. IRISH: Yes. My name is Betty Irish.

MR. CIAVATTIERI: Are there any other comments? If not, I will close the formal part of the record and thank you for coming. We will now move into the informal aspect of the meeting and open the floor to any questions.

MR. JASINSKI: There is one thing I want to make everybody aware of, too. Just recently as of this morning -- excuse me, this afternoon at three o'clock, the administrative record that is located in the Lithgow Public Library had five more volumes of information added to it this afternoon. That information, essentially, contains the many drafts of the RI/FS's, the correspondence between D.E.P., Central

Maine Power, E.C. Jordan and E.P.A. over the years of development of the RI/FS that is from one day in June of '89. Those five volumes are several drafts of all the comments that were made on the drafts and the second drafts and the first drafts that Central Maine Power and E.C. Jordan prepared. I want to make sure you all know that. It is another five volumes that are located on the same two shelves that the first nine volumes were located on, and they will be there all the way through September when we, hopefully, write the record of decision.

MR. CIAVATTIERI: If there are no comments or questions, I would like to thank you all for coming here to these proceedings and for your time and attention. As I indicated in my opening comments, you still have the opportunity to comment on the proposed plan. That period extends on August 19th. The address to which your comments can be sent to is in our proposed plan, and most of us here at the front desk will still stick around for a little while afterwards if you want some questions or general information. Thank you very much.

(The hearing concluded at 8:28 P.M.).

CERTIFICATE

I, William R. Pieske, a Notary Public in and for the State of Maine, hereby certify that the foregoing is a true and accurate transcript of the proceedings as taken by me by means of stenotype.

William R. Pieske

William R. Pieske
My Commission Expires March 14, 1994

UNITED STATES GOVERNMENT

memorandum

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U.S. FISH AND WILDLIFE SERVICE

Ralph Pill Marketplace, 4th Floor
22 Bridge Street
Concord, New Hampshire 03301-4901

TO: Steve Serian, RPM, F O'Connor Site

SEP 6 1989

FROM: Ken Carr, USFWS

SUBJECT: Soil target levels for PCBs at F O'Connor

In researching "effects" levels as part of the effort to determine clean up levels for PCBs in soils at F O'Connor, I found several studies that should be helpful in selecting a final soil criterion.

Tori and Peterle (1983) showed that mourning doves fed diets containing 10 ppm Aroclor 1254 had significantly reduced reproductive success. The same authors reported reproductive impairment in chickens fed diets containing PCBs at 5 ppm, although no statistically significant effects were noted in chickens fed 2 ppm.

McLane and Hughes (1980) reported no adverse effects to screech owls fed diets with 3 ppm Aroclor 1248. However, the owl eggs contained up to 17.8 ppm PCB-a level exceeding the 16.0 ppm level documented by Peakall, et al (1972) as causing delayed growth and development in ringed turtle-doves.

Mink are a well known example of a PCB-sensitive species where a dietary intake of Aroclor 1254 at 2 ppm caused reproductive failure. However, mink may not be unique among mammals in their reproductive sensitivity to PCBs. Linzey (1987) showed statistically significant reduction in both the number of young per litter and their survival in white-footed mice fed Aroclor 1254 at 10 ppm. Mice were not exposed to PCB levels less than 10.0 ppm, and this level should not be interpreted as a NOEL. In fact, many of the effect levels cited above may actually be lower because animal toxicity studies frequently do not use enough exposure levels to allow extrapolation to a NOEL.

From the few examples cited, it would appear that a fair number of species are adversely affected by dietary PCB levels in the 1-3 ppm range.

The Endangerment Assessment (EA) for the site discusses a study by Diercxsens et al (1985) that showed an average BCF for earthworms exposed to soils containing a mixture of Aroclors 1242,1254, and 1260 of 5.82. Assuming a dietary effect level of 2 ppm, and a BCF of 5.82, soil concentrations of PCBs protective of terrestrial wildlife utilizing soil invertebrates would be approximately 0.34 ppm.

It is interesting to note that the EA for the site included much of the same toxicity data that I reviewed, yet the PRP chose a higher dietary effect level - 10 ppm instead of 1-3ppm, and chose a BCF of 1 rather than the 5.82 cited in the EA. Yet table 7-3 of the EA documents reproductive effects to mink in the

0.1 - 1.0 ppm range, and to birds in the 1.0 - 10.0 ppm range. While the argument will likely be raised that effects in the lower concentrations (0.1-1.0; 1.0 - 10.0) were usually not mortal, I would like to point out that reproductive impacts may be just as significant as mortality. I also point out that controlled laboratory exposures of animals to toxins eliminate many of the other diverse stresses to which animals in more natural environments would be exposed, such as extremes in weather, predation, parasitism, increased energy expenditures, and other toxic materials. Additionally, exposures in the "wild' tend to be more chronic than laboratory exposures. The result of the preceding factors is likely the underestimating of the severity of detrimental impacts of contaminants to biota.

However, even with the preceding in mind, I find the logic presented in section 7.3 of the EA apropos. While there is little doubt in my mind that a PCB concentration in soil of 10.0 ppm will not protect the health of terrestrial wildlife using the site, the significance of the population at risk should be considered. Erskine (1977) surveyed breeding birds in a similar habitat, and determined the mean number of bird pairs per square kilometer at 150-450. Using a median of 300 pairs per square kilometer, and conservatively assuming only 2 young per pair, we could reasonably expect the locale to support 1,200 birds per square kilometer. Using these conservative data, the 17-acre site would therefore support approximately 83 individual birds. If we assume a density of 450 pairs per square kilometer, and 4 young per pair, the 17-acre site would support approximately 186 birds in a breeding season. These are not insignificant numbers of birds.

Based on these facts and a proposed clean up level of 10 ppm in soils, I therefore recommend that the PRP reconsider its proposal to remediate soils only to the 10.0 ppm level.

Kenneth Carr

Attachment: Bibliography

cc: Wm Patterson, DOI, Boston, MA
Jane Downing, HRS-CAN3, EPA, Boston, MA

Literature Cited

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PCB Levels in Various Media at F. O'Connor Site

	concentration (ppb)	BCF
MARSH		
Surface water	ND	
Sediment	6,425	
Tadpoles	41,000	6.38/ — *
UPPER LAGOON		
Surface water	6.9	
Sediment	369,728	
Tadpoles	61,000	.0001/ 23,333 *
LOWER LAGOON		
Surface water	2.2	
Sediment	4,756	
Tadpoles	22,000	4.63/ 10,000 *
RIGGS BROOK		
Surface water	ND	
Sediment	776	
Fish	544	.7/ — *
SOIL		
Unspecified location	3,326	5.82 **
Earthworms	19,357 ***	

* BCF -- sediment-biota/ surface water-biota

** BCF -- from Diercxsens et al (1985)

*** Projected, based on BCF of 5.82

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April 7, 1989

Mr Michael Jasinski
Superfund Section
U.S. EPA
JFK Federal Bldg.
Boston, Massachusetts 02203

Dear Mr. Jasinski:

This regards the tentative clean-up levels chosen for contaminants at the F. O'Connor Superfund site in Augusta, Maine. We understand the clean-up target levels for lead, PAHs and PCBs to be 250 ppm, 1 ppm and 1 ppm, respectively. Our comments and recommendations regarding these tentative clean-up levels follow.

PCBs

We have previously commented regarding soil PCB levels that would be protective of migratory birds using the site. However, in considering the practical aspects of contaminant delineation for the entire site, the imprecision associated with low detection limits, and the logistics of excavating and treating large volumes of soil, we believe that the 1 ppm PCB that you have tentatively selected as a clean-up target is appropriate. We have not previously addressed the lead levels nor the PAH levels in soils at the site. They are addressed here.

LEAD

Lead toxicity data for wildlife, especially for waterfowl and birds of prey, are relatively plentiful. Lead dietary exposures show effect levels somewhere between 200 and 500 ppm of lead in food items in some species. Morgan et. al. (1975), documented no adverse effects as reflected in blood biochemistry, to hatchling Japanese Quail fed diets containing 100 ppm of lead, although blood biochemical changes were noted in quail fed diets with 500 ppm lead.

Eastin et al. (1983), saw no adverse effects in week old Mallards fed approximately 200 ppm lead in waste oils, and Edens et. al. (1976), found that diets containing 500 ppm or greater of lead reduced growth in Japanese Quail. While the scientific literature appears to show that lead does bioaccumulate in soil invertebrates, tissue levels are generally not significantly greater than soil levels. Beyer et. al. (1982) reported relatively poor bioaccumulation of lead by earthworms, with lead levels in worms from a lead-rich area averaging 20% greater than in worms from control soils. Beyer, et al. (1984) found little bioaccumulation of lead in woodlice or centipedes that preyed on woodlice. Dallinger and Wieser (1984) found negligible bioaccumulation of lead in land snails fed a lead-contaminated diet.

If we assume a bioconcentration factor of 1 to 2, then soil invertebrates at the site following remediation might contain between 250 and 500 ppm of lead (fresh weight). These levels are at the lower end of the range of effect levels for birds cited above. Because the lead clean-up target level of 250 ppm is close to the estimated background concentrations of lead in area soils, and the bioconcentration of lead by soil invertebrates is not expected to occur in the high end of the range of effect levels, we do not anticipate that lead will exert significant adverse impacts to birds using the site.

PAH's

While it is well documented that small quantities of crude oil that contain PAHs cause significant mortality in bird embryos following application to egg shells, or following ingestion by hatchlings, there is little scientific literature regarding the potential impacts of PAHs, per se, to birds. While we found no data in the literature regarding bioconcentration factors (BCFs) of PAH in terrestrial invertebrates, there are abundant data for BCFs in aquatic invertebrates, which show a wide range of BCFs depending upon the specific PAH and taxon studied. However, dietary exposures to PAHs at the O'Connor site are expected to be limited due to the relatively small volume of contaminated soils present.

Lacking more specific data from the literature, we are unable to recommend a clean-up target. However, extrapolating from experience with aquatic food webs, the 1 ppm target that you are considering for terrestrial habitats will likely be protective of species for which DOI is a trustee.

Sincerely yours,

Gordon E. Beckett

Gordon E. Beckett
Supervisor
New England Area

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
400 RALPH PILL MARKETPLACE
22 BRIDGE STREET
CONCORD, NEW HAMPSHIRE 03301-4901

Mr. Paul Keogh
Acting Regional Administrator
U.S. Environmental Protection Agency
JFK Federal Bldg.
Boston, Massachusetts 02203

AUG 25 1989

Dear Mr. Keogh:

This letter regarding the F. O'Connor Superfund Site in Augusta, Maine, is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) to assist you in formulating a decision with respect to remediation of environmental impacts at the site.

BACKGROUND/SITE DESCRIPTION

The F. O'Connor Site consists of approximately 17 acres of moderately sloping old field land near the eastern boundary of Augusta, Maine. The site was used as a salvage area in the past, and contains automobile bodies, tires, sheet metal, white goods and electrical transformers. The latter contained PCB-laden fluids, which are the primary contaminant of concern at the site. However, PAHs have been found in isolated areas of the site, and elevated lead and volatile organic compounds are more widely distributed on the site. The volatile organic compounds are associated with groundwater, and are not of major concern to wildlife.

The site is primarily upland, although a wetland ("upland marsh") exists on the western portion of the site, and Riggs Brook and an associated scrub/shrub and emergent wetland form the eastern border of the site. Riggs Brook flows north and east to join the Kennebec River in Augusta, upstream of the Edwards Manufacturing Company's dam. The Edwards Dam is currently obstructing free access of anadromous fish to the Kennebec River up river of the dam, including Riggs Brook. However, fish are presently being captured below Edwards Dam, an transported up river. Capture and transport of anadromous fish will continue until fish passage facilities are constructed at the dam in the 1990's. Although Riggs Brook is not identified in the Kennebec River anadromous fish restoration plan as a tributary proposed for active restoration, it undoubtedly will be used by some or all of the anadromous species passing the Edwards Dam.

CONTAMINANT LEVELS

Soils. PCB levels in surface soils at the site range from none detected to 6,200 ppm. Total carcinogenic PAHs range from none detected to 23 ppm. Surface soil lead levels range from 29 to 2,681 ppm.

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Sediments. PCB levels in site sediments are highest in the lagoons established to control surface runoff. Total PCB levels in the Upper Lagoon range from 30 to 1,100 ppm. Lower Lagoon sediments contain PCBs ranging from 3.2 to 40.0 ppm. PCBs in the upland marsh range from 1.3 to 34.0 ppm. Total PCBs detected in Riggs Brook range from none detected to 6.5 ppm. Total PAHs detected in Riggs Brook range from 2.3 to 8.9 ppm.

Biota. Although PCB levels in fish taken from Riggs Brook adjacent to the site were 4-6 times greater than background levels, all fish samples from Riggs Brook showed total PCB levels less than 1.0 ppm (whole body analyses). These levels are common throughout New England, and likely do not represent a significant hazard to fish or other aquatic biota.

Tadpoles taken from the lagoons and upland wetland had significantly greater PCB levels than fish in Riggs Brook. Wet weight, whole body analyses of tadpoles revealed total PCBs in the Upland Marsh, Upper Lagoon and Lower Lagoon of 41.0, 161.0, and 22.0 ppm, respectively.

POTENTIAL HAZARD TO WILDLIFE

PCBs are the major hazard to wildlife using the site. They are widely distributed on the site in levels that can potentially result in detrimental effects to wildlife, especially migratory birds, due to mobilization and bioconcentration in the food chain.

In response to EPA's needs at the site, we developed a worst case hazard assessment for migratory birds exposed to PCBs at the site. Based on PCB dietary studies and soil-to-prey bioconcentration factors, we estimated that soil PCB levels as low as 0.34 ppm could detrimentally impact migratory birds using the site. However, because the assumptions in the hazard assessment were chosen to reflect worst case conditions, a somewhat less restrictive soil level will likely be protective of most migratory birds using the site. The remedial alternative presently identified by your agency as the preferred alternative establishes a surface soil/sediment (exclusive of Riggs Brook) clean up target of 1.0 ppm for PCBs. Future monitoring of the site's biota will provide the opportunity to validate the present judgement that 1.0 ppm will be protective.

The areal extent and relatively moderate level of PCBs in Riggs Brook reduce our concern that these levels will result in acute effects to natural resources for which FWS has protective jurisdiction. Although the maximum level of 6.2 ppm PCBs in Riggs Brook sediments would be of concern if it were wider spread, the environmental benefits that would be realized by removal of these contaminated sediments would likely be offset by the adverse impacts to the Brook and its wetland resulting from removal actions. We therefore recommend no removal of sediments from Riggs Brook at this time, with the stipulation that the Brook's biota continue to be monitored to assure that PCBs (and other site-related contaminants) do not harm this area over time.

Though PAHs have the ability to bioconcentrate, and therefore present a potential hazard to migratory birds consuming prey from the site, on-site soils containing elevated PAHs are confined to relatively small areas. This confined distribution on the site reduces the probability that individual migratory birds will be exposed to a detrimental dose of PAHs. A target level of 1.0 ppm has been proposed for soil PAHs. We expect this level to be protective of migratory birds using the site.

A clean up target for lead of 248 ppm has been proposed for on-site soils. In general, the target level appears to be below soil levels reported in the scientific literature as being associated with detrimental effects on biota.

SUMMARY CONCLUSION

Based on our understanding of site conditions, as summarized above, we recommend the following standards for soil and sediments (exclusive of Riggs Brook): clean up targets for PCBs, PAHs and lead of 1.0 ppm, 1.0 ppm, and 248 ppm, respectively.

Sincerely yours,

Gordon E. Beckett

Gordon E. Beckett
Supervisor
New England Area

United States Department of the Interior

FISH AND WILDLIFE SERVICE
400 RALPH PILL MARKETPLACE
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Mr Michael Jasinski
U.S. Environmental Protection Agency
JFK Building, HPS-1
Boston, MA 02203-2211

September 6, 1989

Dear Mr. Jasinski:

This responds to your August 23 request for comments relative to the likely environmental impacts of Central Maine Power Company's (CMP) proposal to remove and treat only those soils at the F. O'Connor Superfund Site with PCB and PAH levels in excess of 10 ppm. In contrast to the CMP proposal, a remedial action threshold of 1.0 ppm is proposed by EPA and FWS as the maximum value most likely to protect migratory birds and other biota using the site. Our logic for supporting the 1.0 ppm target level was discussed in several meeting with EPA, MEDEP, CMP and its consultants, and is presented in two pieces of correspondence between our two offices.

The arguments presenting the CMP plan focus on PCB levels and their likely effects on biota at the site. Our response to the CMP plan necessarily focuses on the arguments made in support of the higher allowable PCB soil concentrations.

CMP's contentions regarding the likely impact on living environmental receptors of the more relaxed cleanup target are summarized on page 9 of their August 18, 1989 letter to you, as follows:

> "Simple food-chain modeling was conducted for exposure of two groups of organisms, birds and mammals, expected at the site. .... Based on territory size and density data for individuals expected at the Site, and conservative assumptions on dietary habits, it can be concluded that a target clean-up level for soil of 10 ppm will adequately protect the majority of avifauna foraging on-site."

We disagree with several important points presented in this statement and its supporting documentation (i.e., Appendix B-2 of the Draft RI/FS, Nov. 1988). The major point of disagreement is with the statement that a soil concentration of 10 ppm would be protective of the site's avifauna. CMP bases this contention on data from the scientific literature that were used in the food-chain modeling. However, some of these data were misinterpreted in Appendix B-2. For example, in the food-chain model, CMP used a bioconcentration factor (BCF) for ground-dwelling arthropods of 0.5. This is extrapolated from a study of dioxins in arthropod prey of meadowlarks. The prey of meadowlarks are typically vegetarians such as grasshoppers, crickets, butterfly and moth larvae, and adult beetles that live on or above the soil surface. Any food-chain contamination of these insects would be expected to occur via their food, which is predominantly plant material. Because plants apparently do not significant mobilize dioxins from soil, we should expect the low BCF of 0.5 reported in the cited study. We would expect a very different BCF for soil in-fauna such as earthworms and carnivorous beetle larvae that consume soil-living organism. The subsequent use of the 0.5 BCF in PCB food-chain modeling to represent levels in invertebrates other than earthworms, biased downward the estimates of dietary exposures.

A related issue deals with effect levels in migratory birds. In Appendix B-2, CMP summarizes PCB dietary studies cited in the Endangerment Assessment for the site (ICF, 1988). That summary gives the impression that the levels referenced represent the Lowest Observable Effect Level (L.O.E.L.), when in fact many of them simply represent the lowest level tested in a particular study. In many of these studies, effects would likely have been observed had lower levels been tested. In this vein, we note that Appendix B-2 does not reference a study included in ICF's Endangerment Assessment describing a chronic toxicity test in which Bengelese finches were exposed to PCBs (Prestt, et al, 1970). Although the lethal dose to the "average" finch (i.e., LD-50) was estimated to be equivalent to a diet containing 2.5 ppm, some finches in the test died at dietary concentrations equivalent to only 0.06 ppm of PCBs. This study illustrates the fact that effect levels, as developed from LD-50 data, usually overestimate the safe exposure level for all individuals within the species.

However, despite these differences as discussed above, in Appendix B-2, CMP estimates a worst case "no-effect" dietary exposure level of 1.5 ppm. This is within the range of 1-3 ppm that we determined from the scientific literature to be the probable minimum effect level (dietary). With this semblance of agreement on dietary effects levels for birds, the critical issue of dietary dose centers on BCFs and soil levels.

As discussed above, we believe that a BCF of 0.5 underestimates probable body burdens in soil in-fauna, and therefore, also underestimates dietary exposure in birds consuming soil invertebrates. Although not directly applicable to soil BCFs, PCB BCFs determined in several studies for sediment-dwelling invertebrates ranged from 0.33 (sediment PCB concentration of 0.3 ppm) to 4.43 (sediment PCB concentration of 28.0 ppm). As cited in Appendix B-2, at least one study showed earthworms to have a PCB BCF of 5.8. Applying these numbers to the BCF models for robin/killdeer and woodcock, and assuming an average soil PCB concentration of 2.86 ppm as calculated by CMP, estimated dietary intakes range from 8.8 to 14.7 ppm for robin /killdeer, and 12.8 to 15.7 for woodcock. These levels significantly exceed the minimum dietary effect levels estimated by us and CMP. If greater soil PCB levels are used in the model (as opposed to the levels calculated by CMP), commensurately greater dietary intake levels are predicted. Based on these models, birds (or other animals) consuming the site's soil invertebrates as a major portion of their diets would be at risk. In addition to the soil - invertebrate - bird PCB mobilization model used in Appendix B-2, we expect other pathways for contaminant uptake by birds using the site. Higher trophic level species such as shrews, mice, frogs and salamanders exposed to contaminated soils and soil-dwelling invertebrates will in turn be consumed by bird species using the site such as the crow, blue jay, brown thrasher, American kestrel, sharp-shinned hawk, red-tailed hawk, great horned owl, etc.

Birds frequently dust themselves with soil to control external parasites, thereby increasing the likelihood of dermal absorption, inhalation and ingestion (during post-dusting preening). Similarly, direct ingestion of soils occurs in species foraging on the soil surface. Uptake models and effect levels are not developed for these supplemental pathways, and we therefore cannot predict the impacts of uptake via these mechanisms. However, these examples illustrate that bird species other than robin, killdeer and woodcock are exposed to soil-borne contaminants even if they do not consume significant quantities of soil in-fauna.

A final point of disagreement involves estimates by CMP of the number of individuals of three bird species that would use the site. CMP uses data from the scientific literature regarding breeding bird densities to estimate the numbers of robin, killdeer and woodcocks that use the site. While the logic used may apply to populations of individual bird species over large areas, it is not necessarily applicable to smaller areas. For instance, in the case of woodcock population estimates for the site, CMP assumes that only one individual will use the site based on a study showing average densities on large land tracts of 11.2 adults per 100 acres. Average densities developed in this way include acreage not suitable as habitat, but included in the overall area evaluated. However, the O'Connor site is high quality woodcock habitat, and exceeds the quality of "average" woodcock habitat as measured over large land tracts. We therefore expect a density of greater than one woodcock per 8.9 acres (11.2 woodcock per 100 acres). If the one woodcock expected is a male, we would also expect at least one female (woodcock are polygamous) and at least 3-5 young. If we conservatively assume only one female will nest on site, we would expect 5-7 woodcock to be exposed to contaminants at the site each year. Similar arguments are also germane to the site's potential killdeer and robin population densities, as well as other species whose diets are comprised of soil-dwelling organisms or species which prey on soil-dwelling organisms.

Therefore, we expect greater numbers of many species of birds using the site to be at potential risk from soil PCB levels exceeding 1.0 ppm. We do not concur with CMP's contention that a soil PCB level of 10.0 ppm (or 2.86 ppm) would be protective of migratory birds whose diet is significantly composed of soil-dwelling organisms or consumers of soil-dwelling organisms.

Sincerely yours,

Gordon E. Beckett

Gordon E. Beckett
Supervisor
New England Area

STATE OF MAINE

Department of Environmental Protection

MAIN OFFICE: RAY BUILDING, HOSPITAL STREET, AUGUSTA
MAIL ADDRESS: State House Station 17, Augusta, 04333
207-289-7688

JOHN R. McKERNAN, JR.
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

August 30, 1989

SEPT 05 89

Mike Jasinski, Remedial Project Manager
U.S. EPA
Waste Management Division (HPS-CAN 1)
JFK Federal Building
Boston, MA 02203

RE: F. O'Connor Superfund Site, Augusta, Maine
Target Clean-up levels for PCB's and cPAHs

Dear Mr. Jasinski:

The following outlines the Maine Department of Environmental Protection's (DEP) and the Maine Department of Human Services concerns regarding the selection of one (1) ppm clean-up standards for PCB and cPAH contaminants for the above referenced site:

1. Based on a December 5, 1988 interoffice memo from State Toxicologist Dr. Robert Frakes, the Bureau of Health risk assessment policy states that a reasonable (plausable) worst case assumption be used in estimating the health risk associated in chemical exposure. For your reference a copy of that memorandum is enclosed.

2. The Bureau of Health considers an upper level lifetime cancer risk of one per one hundred thousand be used as a basis for public health considerations.

3. Dr. Frakes calculated that 0.49 ppm PCB, and 0.33 ppm cPAH is the target clean-up levels using the plausable maximum exposure assumptions and the 10-5 risk level. This data was obtained from the F.O'Conner Sites Endangerment Assessment.

   If the 10-6 risk level were used for the calculation, a clean-up level of 49 ppB, PCB ,and 33 ppb cPAH would be the target levels.

4. Dr. Frakes referenced that a clean up level in the neighborhood of 1 ppm is substantiated by other agency policies.

5. The Department of the Interior (DOI) US Fish and Wildlife Service supports a 0.34 ppm clean up level in order to protect terrestrial

wildlife. This information is outlined in a September 6, 1988 memorandum, which is also enclosed for your reference.

Central Maine Power on the other hand argues for a clean-up standards of 10 ppm for PCB's based on the criteria of: 10-5 risk level and a most probable case exposure scenario.

The DEP concurs with the EPA's proposed target clean-up level of 1 ppm for PCB's an cPAH's for the F.O'Connor Superfund Site, in Augusta, Maine basded on both environmental and public health standards.

The DEP trusts that this information is helpful to you and if you have additional questions please don't hesitate to contact me at (207)289-2651.

Sincerely,

Thomas J. Benn

THOMAS BENN
Div. of Licensing a Enforcement
Bureau of Oil & Hazardous Materials Control

TB:al:tbjasinsk

cc: Robert Frakes, Bureau of Health
Al Prysunka, Department of Environmental Protection
Scott Whittier, Department of Environmental Protection
Don Robbins, Department of Environmental Protection

John R. McKernan, Jr.
Governor

Rollin Ives
Commissioner

STATE OF MAINE
DEPARTMENT OF HUMAN SERVICES
AUGUSTA, MAINE 04333

M E M O R A N D U M

TO: Cynthia Kuhns, BOHMC, D.E.P.

FROM: Robert Frakes, Ph.D., State Toxicologist, DHS RAF

SUBJECT: O'Connor Site Target Clean-up Levels for PCBs and cPAHs

DATE: December 5, 1988

This is a reiteration of my earlier comments on the proposed Target Clean-up Levels for the O'Connor Site. You and I already presented these arguments to EPA, CMP, E.C. Jordan, and Federal Natural Resource Trustees at a meeting in Portland on September 28th.

Bureau of Health risk assessment policy calls for the use of reasonable worst case assumptions for estimating the health risks associated with chemical exposure. Also, the Bureau of Health considers an upper bound, lifetime cancer risk of one per one hundred thousand as a basis for a public health concern (Policy for Identifying and Assessing the Health Risks of Toxic Substances, 1988). Target clean-up levels for hazardous waste sites in Maine should reflect both of these policies, except in the unusual situation where clean up to these levels is not possible.

I have recalculated the target clean-up levels using the plausible maximum exposure assumptions given in the Endangerment Assessment (Table 4-5):

A) Age 1 - 5 yrs:

Contact: 2300 mg/day x 0.03 (absorption factor) x 200 days/365 days x 5 yrs/70 yrs x 1/15 kg = 0.180 mg/kg/day

Ingestion: 500 mg/day x 0.45 (absorption factor) x 200 days/365 days x 5 yrs/70 yrs x 1/15 kg = 0.587 mg/kg/day

B) Age 6 - 11 yrs:

Contact: 3500 mg/day x 0.03 x 200 days/365 days x 6 yrs/70 yrs x 1/30 kg = 0.164 mg/kg/day

Ingestion: 250 mg/day x 0.45 x 200 days/365 days x 6 yrs/70 yrs x 1/30 kg = 0.176 mg/kg/day

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C) Age 12 - 18 yrs:

Contact: 5600 mg/day x 0.03 x 200 days/365 days x 7 yrs/70 yrs x 1/54 kg = 0.170 mg/kg/day

Ingestion: 100 mg/day x 0.45 x 200 days/365 days x 7 yrs/70 yrs x 1/54 kg = 0.046 mg/kg/day

Total Intake Factor Over 18 Years = 1.32 mg/kg/day

PCB Target Clean-up Level = $\dfrac{6.49 \times 10^{-7}}{1.32}$ $\dfrac{\text{mg PCB/kg/day}}{\text{mg Soil/kg/day}}$ = 0.49 ppm

cPAH Target Clean-up Level = $\dfrac{4.35 \times 10^{-7}}{1.32}$ $\dfrac{\text{mg cPAH/kg/day}}{\text{mg Soil/kg/day}}$ = 0.33 ppm

The above are based on a 10^{-5} upper limit cancer risk. For a 10^{-6} risk, the target clean-up levels would be 49 ppb for PCBs and 33 ppb for cPAHs.

In future risk assessments for hazardous waste sites, calculations should be presented for both the average exposure and the plausible maximum exposure.

Please note that the above calculations do not include adult exposures through soil contact, such as home gardeners. Including these exposures would result in lower target clean-up levels.

The 10^{-5} clean-up level calculated above for PCBs (0.49 ppm) is similar to the PCB soil concentration proposed by the USFWS trustee for protection of terrestrial wildlife (0.34 ppm). Also, the average case 10^{-6} target clean-up level is 2 ppm for PCBs and 1 ppm for cPAHs. These different approaches all argue for a target clean-up level in the neighborhood of 1 ppm, rather than the 10 ppm level proposed by the PRP.

cc: Lani Graham, M.D.
Greg Bogdan, Dr. P.H.
Ann Melville

3657E/8-9

STATE OF MAINE
Department of Environmental Protection
MAIN OFFICE: RAY BUILDING, HOSPITAL STREET, AUGUSTA
MAIL ADDRESS: State House Station 17, Augusta, 04333
207-289-7688

JOHN R. McKERNAN, JR
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

September 26, 1989

Paul Keough, Acting Regional Administrator
U.S. EPA, Region I
J.F. Kennedy Federal Building
Boston, MA 02203-2211

RE: F. O'Connor Superfund Site in Augusta, Maine

Dear Mr. Keough:

The Maine Department of Environmental Protection (DEP) has reviewed the August 31, 1989 Draft Record of Decision (ROD) with regard to the Remedial Action remedy selection for the F. O'Connor Superfund Site in Augusta, Maine.

Based on that review the DEP concurs with the selected remedial action which consists of the comprehensive multi-component approach for the overall site remediation of soils, sediments, surface waters and groundwater contamination at the site as outlined in the following:

I. Source Control

1. Draining and treatment/disposal of surface water in the upland marsh and lagoons.
2. Re-routing of the existing surface water drainage patterns.
3. Decontamination/demolition of the on-site barn.
4. Clearing of vegetation, installation of erosion control measures, and excavation of contaminated soils and sediments.
5. On-site treatment of contaminated soils and lagoon/marsh sediments using a solvent extraction technology.
6. Treatment of contaminated soil and sediment residue, for that failing EP Toxicity tests, on-site using a solidification/fixation process.

7. Transportation and off-site disposal at a licensed RCRA/TSCA landfill of solidified soil and sediment residue, and soil and sediment residue that does not achieve all target cleanup levels following solvent extraction.

8. Site restoration.

9. Establishing on-site compensatory wetlands of the United States.

II. Management of Migration

A. Groundwater

1. Establishment of temporary institutional controls to restrict site access and prohibit groundwater usage until remediation goals are achieved.

2. Installation of on-site groundwater extraction well(s).

3 On-site groundwater treatment system and recharge system installation.

4. Treatment system monitoring, and operation and maintenance.

B. Riggs Brook Sediment

1. Establishment and implementation of extensive sediment and biota sampling and analysis program within Riggs Brook to monitor the effectiveness of the remedial action.

2. Implementation of public education programs to increase awareness regarding conditions at the Site.

This concurrence is based upon the State's understanding that:

A. The DEP will participate in the negotiations with the responsible parties and in the review and approval of operational designs and monitoring plans for the site clean up to the extent provided for in CERCLA.

B. In the event the agencies are unsuccessful in reaching a signed agreement with the responsible parties to undertake the selected remedial actions, the DEP will agree to expend State Funds for ten (10) percent of the EPA's remediation costs for the site. Based upon the Draft ROD the DEP's share of the estimated costs will be approximately $1,322,000. Those funds can be allocated by the DEP from the Uncontrolled Hazardous Substances Sites Bond Account.

C. The groundwater extraction and treatment system will be designed to remove and treat all identified hazardous substances present in the groundwater to a level acceptable to the Maine DEP and the EPA.

D. The site conditions shall be reviewed within five (5) years from the initiation of the remedial action to assure that public health and the environment are not adversely impacted by the remedial actions.

The DEP looks forward to working with the EPA to resolve the environmental problems posed by this site. If you need additional information do not hesitate to call myself or members of my staff.

Sincerely,

Dean C Marriott

Dean C. Marriott
Commissioner

cc: Al Prysunka, Director BOHMC
Scott Whittier, Director, Div. of Licensing & Enforcement

O'Connor Co. Site

NPL Site Administrative Record

Index

Compiled: July 13, 1989
Updated: August 9, 1989
ROD Signed: September 27, 1989

Prepared for

Region I
Waste Management Division
U.S. Environmental Protection Agency

With Assistance from

AMERICAN MANAGEMENT SYSTEMS, INC.
One Kendall Square, Suite 2200 • Cambridge, Massachusetts 02139 • (617) 577-9915

Introduction

This document is the Index to the Administrative Record for the O'Connor Co. Site National Priorities List (NPL) site. Section I of the Index cites site-specific documents, and Section II cites guidance documents used by EPA staff in selecting a response action at the site.

The Administrative Record is available for public review at EPA Region I's Office in Boston, Massachusetts, and at the Lithgow Public Library, Winthrop Street, Augusta, Maine 04330. Questions concerning the Administrative Record should be addressed to the EPA Region I site manager.

The Administrative Record is required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA).

Section I

Site-Specific Documents

ADMINISTRATIVE RECORD INDEX

for the

O'Connor Co. NPL Site

1.0 Pre-Remedial

1.2 Preliminary Assessment

1. "Potential Hazardous Waste Site Identification and Preliminary Assessment" Form, EPA Region I (June 10, 1982).

1.3 Site Inspection

1. "Potential Hazardous Waste Site - Site Inspection Report" Form, EPA Region I (July 15, 1982).
2. "Storage Facilities Site Inspection Report (Supplemental Report)" Form, EPA Region I.

1.6 Hazardous Ranking System (HRS)

1. Hazardous Ranking Package, Ecology and Environment, Inc. (July 23, 1982).

1.13 FIT Related Correspondence

1. Memorandum from W.D. Wall, NUS Corporation to File (April 14, 1983). Concerning conversation regarding site history with Oliver G. Coulling, F. O'Connor Company.

2.0 Removal Response

2.1 Correspondence

1. Memorandum from Donald F. Berger, EPA Region I to Elliot M. Thomas, EPA Region I (August 28, 1984). Concerning attached preliminary data and map.
2. Letter from Clifford H. Goodall, Dyer, Goodall and Zeegers (Attorney for F. O'Connor Company) to Marilyn Wade, EPA Region I (March 18, 1985). Concerning container inventory and identification project with attached:
   A. Letter from Clifford H. Goodall, Dyer, Goodall and Zeegers (Attorney for F. O'Connor Company) to Charles C. Bering, EPA Region I (March 18, 1985). Concerning response to fencing plan.
   B. Memorandum from David S. Dyer, Acheron Engineering Services to William B. Ball, Acheron Engineering Services (February 21, 1985). Concerning identification of tanks and drums to be sampled.
   C. Site Map, Acheron Engineering Services (January 1985).
3. Letter from Andrew K. Towt, Central Maine Power Company to Marilyn Wade, EPA Region I (December 9, 1985). Concerning sampling events.
4. Letter from Andrew K. Towt, Central Maine Power Company to Marilyn Wade, EPA Region I (January 17, 1986). Concerning tank inspection and removal plans.
5. Letter from Andrew K. Towt, Central Maine Power Company to Marilyn Wade, EPA Region I (January 17, 1986). Concerning Tank Sampling Analysis Plan.
6. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (March 28, 1986). Concerning QA/QC plan for tank sample analysis.
7. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (June 2, 1986). Concerning tank sampling program.

2.1 Correspondence (cont'd.)

8. Telephone Notes Between Steven A. Serian, EPA Region I and Andrew K. Towt, Central Maine Power Company (June 16, 1986). Concerning extension of fence.
9. Letter from Marc Guerin, Clean Harbors, Inc. to Andrew K. Towt, Central Maine Power Company (October 9, 1986). Concerning disposal facilities for materials from tank cleaning phase.
10. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (November 26, 1986). Concerning the solid waste area and extension of the security fence.
11. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (December 2, 1986). Concerning fencing requirements.
12. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (December 9, 1986). Concerning temporary fencing and attached site map.
13. Letter from Bruce A. Fowler, E.C. Jordan Co. to Andrew K. Towt, Central Maine Power Company (July 23, 1987). Concerning decontamination procedures following scrap removal operations.
14. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (July 29, 1987). Concerning the decontamination of trench water and attached "Appendix 12.B. Correlation Chart of Screen Openings and Sieve Sizes."
15. Letter from Cynthia M. Kuhns, State of Maine Department of Environmental Protection to Andrew K. Towt, Central Maine Power Company (August 17, 1987). Concerning potential danger to public posed by electrical devices uncovered during scrap removal operation.
16. Memorandum from Steven A. Serian, EPA Region I to File (August 22, 1988). Concerning removal of contaminated PCBs adjacent to Route 17.

2.2 Removal Response Reports

Reports

1. "F. O'Connor Hazardous Waste Site," (TDD 01-8504-05) Roy F. Weston, Inc. (May 30, 1985).
2. Letter from William B. Ball, Acheron Engineering Services to Marilyn Wade, EPA Region I (August 22, 1985). Concerning transmittal of attached "Quality Assurance Quality Control Project Plan for Chemical Analysis of Samples from the O'Connor Hazardous Waste Site," ERCO/ENSECO Inc.
3. "Tank Sampling," Roy F. Weston, Inc. (December 5, 1985).
4. "Project Operation Plan for Sampling and Analysis at the F. O'Connor Company Site - Phase I - Hazardous Substance Identification, Removal and Disposal Program for Storage Tanks and Drum Samples," Clean Harbors, Inc. (July 31, 1986).
5. "Appendix I - Health & Safety Plan," Clean Harbors, Inc. (July 31, 1986).
6. "Appendix II - Field Sampling Standard Operating Procedures," Clean Harbors, Inc. (July 31, 1986).
7. "Appendix III - Quality Assurance/Quality Control for Inorganic and Organic Analysis," Clean Harbors, Inc. (July 31, 1986).
8. "Appendix IV - Quality Assurance/Quality Control for Sample Collection and Pollutant Analysis," Clean Harbors, Inc. (July 31, 1986).

2.2 Removal Response Reports (cont'd.)

9. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I and Cynthia M. Kuhns, State of Maine Department of Environmental Protection (October 5, 1987). Concerning transmittal of attached:
   A. "Uniform Hazardous Waste Manifest" Form, Commonwealth of Massachusetts Department of Environmental Quality Engineering (August 21, 1987).
   B. "Scrap Removal Program Summary," prepared by E.C. Jordan Co. for Central Maine Power Company (October 1987).

Comments

10. Comments Dated April 15, 1986 from Steven A. Serian, EPA Region I on the "Quality Assurance Quality Control Project Plan for Chemical Analysis of Samples from the O'Connor Hazardous Waste Site," ERCO/ENSECO Inc.
11. Comments Dated August 21, 1986 from Charles Porfert, EPA Region I on the "Quality Assurance Quality Control Project Plan for Chemical Analysis of Samples from the O'Connor Hazardous Waste Site," ERCO/ENSECO Inc.
12. Comments Dated October 20, 1986 from Steven A. Serian, EPA Region I on the July 31, 1986 "Project Operation Plan for Sampling and Analysis at the F. O'Connor Company Site - Phase I - Hazardous Substance Identification, Removal and Disposal Program for Storage Tanks and Drum Samples," Clean Harbors, Inc.
13. Comments Dated October 29, 1987 from Steven A. Serian, EPA Region I on the October 1987 "Scrap Removal Program Summary," prepared by E.C. Jordan Co. for Central Maine Power Company.

Responses to Comments

14. Response Dated May 7, 1986 from Andrew K. Towt, Central Maine Power Company to the April 15, 1986 Comments from Steven A. Serian, EPA Region I.
15. Response Dated November 13, 1987 from Andrew K. Towt, Central Maine Power Company to the October 29, 1987 Comments from Steven A. Serian, EPA Region I.

2.3 Sampling and Analysis Data

1. Memorandum from Joseph Montanaro and Moira Lataille, EPA Region I to Donald F. Berger, EPA Region I (August 21, 1984). Concerning PCB screening data.
2. Memorandum from Joseph Montanaro and Moira Lataille, EPA Region I to Donald F. Berger, EPA Region I (August 23, 1984). Concerning correction of PCB screening data analytical procedure.
3. Memorandum from Joseph Montanaro and Moira Lataille, EPA Region I to Donald F. Berger, EPA Region I (August 24, 1984). Concerning soil analysis of samples 53775 and 53772.
4. "Shallow Soils and Tank Sampling Plan," Acheron Engineering Services and J.K. Richard Associates (March 1985).
5. Memorandum from Joseph Montanaro and Richard Siscanaw, EPA Region I to Donald F. Berger, EPA Region I (December 2, 1985). Concerning polychlorinated biphenyl and pesticide analysis in sediment and soil.
6. Memorandum from Marsha M. Lee, EPA Region I to Ira Leighton, EPA Region I (December 23, 1985). Concerning polychlorinated biphenyl analysis in transformer fluid and waste oils.

2.3 Sampling and Analysis Data (cont'd.)

7. Letter from Andrew K. Towt, Central Maine Power Company to Marilyn Wade, EPA Region I (January 15, 1986). Concerning transmittal of attached "Shallow Soils Sampling Program," Central Maine Power Company (January 1986).
8. Letter from Anthony F. Andronico, Roy F. Weston Inc. to Steven A. Serian, EPA Region I (March 13, 1986). Concerning sample numbers 77234 and 77239.
9. Letter from John D. Tewhey, E.C. Jordan Co. to Andrew K. Towt, Central Maine Power Company (October 15, 1987). Concerning transmittal of attached "Proposed Electrical Equipment Soil Sampling Plan," prepared by E.C. Jordan Co. for Central Maine Power Company (October 1987).

2.6 Work Plans and Progress Reports

Reports

1. "Proposal for the F. O'Connor Site - Augusta, Maine," Clean Harbors, Inc. (August 21, 1986).
2. Letter from John D. Tewhey, E.C. Jordan Co. to Andrew K. Towt, Central Maine Power Company (July 1, 1987) with attached "Scrap Removal Logistics Plan," prepared by E.C. Jordan Co. for Central Maine Power Company (July 1987).

Comments

3. Comments Dated September 8, 1986 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the August 21, 1986 "Proposal for the F. O'Connor Site - Augusta, Maine," Clean Harbors, Inc.
4. Comments Dated October 7, 1986 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the August 21, 1986 "Proposal for the F. O'Connor Site - Augusta, Maine," Clean Harbors, Inc.
5. Comments Dated October 20, 1986 from Steven A. Serian, EPA Region I on the August 21, 1986 "Proposal for the F. O'Connor Site - Augusta, Maine," Clean Harbors, Inc.
6. Comments Dated July 24, 1987 from Steven A. Serian, EPA Region I on the July 1987 "Scrap Removal Logistics Plan," prepared by E.C. Jordan Co. for Central Maine Power Company.
7. Comments Dated July 28, 1987 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the July 1987 "Scrap Removal Logistics Plan," prepared by E.C. Jordan Co. for Central Maine Power Company.

Responses to Comments

8. Response Dated September 17, 1986 from Marc Guerin, Clean Harbors, Inc. to the September 8, 1986 Comments from Cynthia M. Kuhns, State of Maine Department of Environmental Protection.

3.0 Remedial Investigation (RI)

3.1 Correspondence

1. Telephone Notes Between Jeff Orient, NUS Corporation and J.K. Richard and Eric Sandin, J.K. Richard Associates (March 21, 1985). Concerning surficial deposits and shallow soil sampling.
2. Telephone Notes Between Gordon Fuller, State of Maine Department of Environmental Protection and Jeff Orient, NUS Corporation (March 21, 1985). Concerning groundwater contamination.
3. Letter from Andrew K. Towt, Central Maine Power Company to Marilyn Wade, EPA Region I (January 8, 1986). Concerning transmittal of the work plan modification proposal.
4. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (June 10, 1986). Concerning transmittal of the Project Operations Plan.
5. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (June 12, 1986). Concerning transmittal of the Preliminary ARARs Report.
6. Letter from Steven A. Serian, EPA Region I to Bruce Fowler, E.C. Jordan Co. (June 24, 1986). Concerning monitoring wells.
7. Letter from Steven A. Serian, EPA Region I to John D. Tewhey, E.C. Jordan Co. (July 23, 1986). Concerning transmittal of comments on the Project Operations Plan.
8. Letter from Cynthia M. Kuhns, State of Maine Department of Environmental Protection to John D. Tewhey, E.C. Jordan Co. (August 13, 1986). Concerning partial approval of the Project Operations Plan.
9. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (August 18, 1986). Concerning surficial soil sampling grid.
10. Letter from Cynthia M. Kuhns, State of Maine Department of Environmental Protection to Andrew K. Towt, Central Maine Power Company (September 3, 1986). Concerning shallow soil sampling.
11. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (September 10, 1986). Concerning September 15, 1986 meeting regarding sampling.
12. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (September 22, 1986). Concerning collection and analysis of samples.
13. Memorandum to File, Bruce A. Fowler, E.C. Jordan Co. (October 23, 1986) with attached October 6, 1986 "Conference Report," prepared by E.C. Jordan Co. for Central Maine Power Company.
14. Letter from Denis G. Young for Gretchen A. Mikeska, E.C. Jordan Co. to Steven A. Serian, EPA Region I (October 24, 1986). Concerning biotic sampling.
15. Letter from Gretchen A. Mikeska, E.C. Jordan Co. to Steven A. Serian, EPA Region I (November 4, 1986). Concerning collection and preservation of aquatic biota samples.
16. Letter from Bruce A. Fowler, E.C. Jordan Co. to Steven A. Serian, EPA Region I (November 19, 1986). Concerning sampling of monitoring and domestic wells.
17. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (November 19, 1986). Concerning transmittal of attached November 18, 1986 Meeting Summary, EPA Region I, Camp Dresser & McKee Inc., E.C. Jordan Co., and Central Maine Power Company.
18. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (December 1, 1986). Concerning response to November 18, 1986 meeting summary.

19. Meeting Notes, EPA Region I, U.S. Department of the Interior Fish and Wild Life Service, Central Maine Power Company, E.C. Jordan Co., and Camp Dresser & McKee Inc. (December 17, 1986).
20. Letter from David Webster for Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (May 4, 1987). Concerning summary of the April 9, 1987 meeting.
21. Memorandum from Brian Butler, Camp Dresser & McKee Inc. to Richard Christian, Camp Dresser & McKee Inc. (May 26, 1987). Concerning April 28, 1987 groundwater sampling round oversight.
22. Letter from Cynthia M. Kuhns, State of Maine Department of Environmental Protection to Andrew K. Towt, Central Maine Power Company (June 1, 1987). Concerning invertebrate community structure analysis meeting of April 23, 1987.
23. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I and Cynthia M. Kuhns, State of Maine Department of Environmental Protection (June 11, 1987). Concerning attached summary of the June 10, 1987 Tour II sampling meeting.
24. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I and Cynthia M. Kuhns, State of Maine Department of Environmental Protection (June 15, 1987) with attached July 15, 1987 Memorandum from Bruce Fowler, E.C. Jordan Co. to Andrew K. Towt, Central Maine Power Company. Concerning inorganic sample duplication.
25. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (June 16, 1987). Concerning Tour II monitoring program of the Remedial Investigation.
26. Letter from Cynthia M. Kuhns, State of Maine Department of Environmental Protection to Andrew K. Towt, Central Maine Power Company (June 23, 1987). Concerning June 10, 1987 Tour II sampling meeting.
27. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (July 22, 1987). Concerning August 4, 1987 meeting agenda.
28. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (August 11, 1987). Concerning response to August 4, 1987 Remedial Investigation meeting.
29. Letter from Cynthia M. Kuhns, State of Maine Department of Environmental Protection to Andrew K. Towt, Central Maine Power Company (August 18, 1987). Concerning decisions made at August 4, 1987 meeting.
30. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (September 1, 1987) with attached August 31, 1987 Letter from John D. Tewhey, E.C. Jordan Co. to Andrew K. Towt, Central Maine Power Company. Concerning Endangerment Assessment planning, coordination, and implementation.
31. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (September 17, 1987). Concerning the Remedial Investigation/Feasibility Study time line.
32. Letter from Andrew K. Towt, Central Maine Power Company to Romeo and Pauline St. Pierre (May 17, 1988). Concerning the attached test results from well sampling.
33. Letter from Thomas Benn, State of Maine Department of Environmental Protection to Andrew K. Towt, Central Maine Power Company (September 8, 1989). Concerning September 6, 1989 meeting regarding Draft Final Remedial Investigation/Feasibility Study.
34. Letter from Andrew K. Towt, Central Maine Power Company to Thomas Benn, State of Maine Department of Environmental Protection (September 18, 1989). Concerning receipt of September 6, 1989 letter from Thomas Benn and clarification of Central Maine Power Company's position.

3.2 Sampling and Analysis Data

The Sampling and Analysis Data for the Remedial Investigation (RI) may be reviewed, by appointment only, at EPA Region I, Boston, Massachusetts.

3.4 Interim Deliverables

Reports

1. "Remedial Action Master Plan," NUS Corporation (September 1983).
2. "Task 9 - Project Operations Plan - Remedial Investigation/Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (August 1986).

Comments

3. Comments Dated August 15, 1986 from Steven A. Serian, EPA Region I on the August 1986 "Task 9 - Project Operations Plan - Remedial Investigation/ Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company.
4. Comments Dated October 10, 1986 from Steven A. Serian, EPA Region I on the August 1986 "Task 9 - Project Operations Plan - Remedial Investigation/ Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company.
5. Comments Dated October 15, 1986 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the August 1986 "Task 9 - Project Operations Plan - Remedial Investigation/Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company.

3.5 Applicable and Appropriate or Relevant Requirements (ARARs)

Reports

1. "Preliminary Indication of ARARs, Remedial Investigation/Feasibility Study - Task 3," E.C Jordan Co. for Central Maine Power Company (June 1986).
2. "Preliminary Indication of ARARs, Remedial Investigation/Feasibility Study - Task 3," E.C Jordan Co. for Central Maine Power Company (August 1987).

Comments

3. Comments Dated July 30, 1986 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the June 1986 "Preliminary Indication of ARARs, Remedial Investigation/Feasibility Study - Task 3," E.C Jordan Co. for Central Maine Power Company.
4. Comments Dated October 19, 1987 from Steven A. Serian, EPA Region I on the August 1987 "Preliminary Indication of ARARs, Remedial Investigation/ Feasibility Study - Task 3," E.C Jordan Co. for Central Maine Power Company.

Responses to Comments

5. Letter from Gretchen A. Mikeska, E.C. Jordan Co. to Steven A. Serian, EPA Region I (December 12, 1986). Concerning receipt of ARARs comments from EPA Region I and State of Maine Department of Environmental Protection.

3.6 Remedial Investigation (RI) Reports

Reports

1. First "Draft Remedial Investigation Report - Volume I: Technical Report," prepared by E.C. Jordan Co. for Central Maine Power Company (December 1987).
2. First "Draft Remedial Investigation Report - Volume II: Appendices," prepared by E.C. Jordan Co. for Central Maine Power Company (December 1987).
3. Second "Draft Remedial Investigation/Feasibility Study - Volume I: Technical Report - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988).
4. Second "Draft Remedial Investigation/Feasibility Study - Volume II: Appendices - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988).

Figures 4-7 and 4-9 from the record cited in entry number 5 may be reviewed, by appointment only, at EPA Region I, Boston, Massachusetts.

5. "Draft Final - Remedial Investigation/Feasibility Study - Volume I - Technical Report - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (June 1989).
6. "Draft Final - Remedial Investigation/Feasibility Study - Volume II - Appendices - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (June 1989).
7. Errata Sheet for the June 1989 O'Connor Co. Site "Draft Final Remedial Investigation/Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (July 19, 1989).

Comments

8. Comments Dated March 30, 1989 from Michael Jasinski, EPA Region I on the:
   - Second "Draft Remedial Investigation/Feasibility Study - Volume I: Technical Report - Remedial Investigation," prepared by E.C. Jordan Co for Central Maine Power Company (November 1988),
   - Second "Draft Remedial Investigation/Feasibility Study - Volume II: Appendices - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
   - Second "Draft Remedial Investigation/Feasibility Study - Volume III: Technical Report - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
   - Second "Draft Remedial Investigation/Feasibility Study - Volume IV: Appendices - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
   - "Summary of the Solvent Extraction Treatability Study on Soils from the O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company (February 1989).

3.6 Remedial Investigation (RI) Reports (cont'd.)

9. Comments Dated April 10, 1989 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the:
    - Second "Draft Remedial Investigation/Feasibility Study - Volume I: Technical Report - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume II: Appendices - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume III: Technical Report - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume IV: Appendices - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - "Summary of the Solvent Extraction Treatability Study on Soils from the O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company (February 1989).
10. Questions and Request for EPA Clarification Dated April 26, 1989 from James R. Wallace, prepared by E.C. Jordan Co. for Central Maine Power Company on the:
    - Second "Draft Remedial Investigation/Feasibility Study - Volume I: Technical Report - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume II: Appendices - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume III: Technical Report - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume IV: Appendices - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - "Summary of the Solvent Extraction Treatability Study on Soils from the O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company (February 1989).

Responses to Comments

11. Response Dated May 9, 1989 from Michael Jasinski, EPA Region I to the April 26, 1989 Comments from James R. Wallace, E.C. Jordan Co. for Central Maine Power Company.
12. Response Dated June 30, 1989 from James R. Wallace, E.C. Jordan Co. for Central Maine Power Company to the March 30, 1989 Comments from Michael Jasinski, EPA Region I.

3.7 Work Plans and Progress Reports

Reports

1. "Appendix B - CERCLA 106 Consent Order - Work Plan - Remedial Investigation/Feasibility Study," NUS Corporation (April 1986).
2. Monthly Progress Reports in Compliance with Items 37 and 53 of Docket No. I-86-1031 Consent Agreement, prepared by Central Maine Power Company for EPA Region I and State of Maine Department of Environmental Protection (June 1986 through September 1989).
3. Letter from Bruce A. Fowler, E.C. Jordan Co. to Steven A. Serian, EPA Region I (September 9, 1986). Concerning attached "Revised Groundwater Monitoring Location Plan."
4. Letter from Gretchen A. Mikeska, E.C. Jordan Co. to Steven A. Serian, EPA Region I (September 10, 1986). Concerning attached "Task 12 - Environmental Assessment, Phase II - Biotic Sampling" Work Plan, prepared by E.C. Jordan Co. for Central Maine Power Company.
5. Letter from Bruce A. Fowler, E.C. Jordan Co. to Steven A. Serian, EPA Region I (October 16, 1986). Concerning attached "Task 16 - Environmental Sampling - Amended Sediment Sampling Program (10/16/86)" Work Plan.
6. "Trip Report: Biota Sampling - Task 12 - Environmental Assessment - Phase II - Extent of Wetland Contamination," ECO-ANALYSTS, INC. (November 1986).
7. Trip Report on a Visit to O'Connor Co. Site, Natasha Brock, C.C. Johnson & Malhotra and David Brooks, Camp Dresser & McKee Inc. (December 9, 1986). Concerning biotic sampling oversight.
8. "Domestic Well Survey - Task 11," E.C. Jordan Co.

Comments

9. Comments Dated October 15, 1986 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the "Domestic Well Survey - Task 11," E.C. Jordan Co.
10. Comments Dated October 17, 1986 from Steven A. Serian, EPA Region I on the "Domestic Well Survey - Task 11," prepared by E.C. Jordan Co. for Central Maine Power Company and the "Task 12 - Environmental Assessment, Phase II - Biotic Sampling" Work Plan, prepared by E.C. Jordan Co. for Central Maine Power Company.
11. Comments from Susanna von Oettingen, U.S. Department of the Interior Fish and Wildlife Service on the "Task 12 - Environmental Assessment, Phase II - Biotic Sampling," Work Plan, prepared by E.C. Jordan Co. for Central Maine Power Company.

3.9 Health Assessments

1. "Preliminary Health Assessment for F. O'Connor," U.S. Department of Health and Human Services Public Health Service Agency for Toxic Substances and Disease Registry (ATSDR) (April 10, 1989).
2. Memorandum from Louise A. House, U.S. Department of Health and Human Services Public Health Service Agency for Toxic Substances and Disease Registry (ATSDR) to Michael Jasinski, EPA Region I (April 14, 1989). Concerning proposed target cleanup levels.

3.10 Endangerment Assessments

1. "Endangerment Assessment for the F. O'Connor Site in Augusta, Maine," Clement Associates, Incorporated for Camp Dresser & McKee Inc. (January 29, 1988).

4.0 Feasibility Study (FS)

4.1 Correspondence

1. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (December 23, 1987). Concerning remedial alternatives.
2. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I and Cynthia M. Kuhns, State of Maine Department of Environmental Protection (April 1, 1988). Concerning Central Maine Power Company's position regarding treatability studies.
3. Letter from Andrew K. Towt, Central Maine Power Company to Steven A. Serian, EPA Region I (September 15, 1988). Concerning proposed schedule amendments.
4. Letter from Michael Jasinski, EPA Region I to James R. Wallace, E.C. Jordan Co. (October 21, 1988). Concerning transmittal of package containing EPA's promulgated exemption rule for samples used in treatability studies.
5. Letter from Michael Jasinski, EPA Region I to James R. Wallace, E.C. Jordan Co. (November 7, 1988). Concerning PCB treatment technologies.
6. Letter from William H. Laubenstein III, Central Maine Power Company to Elissa Tonkin, EPA Region I (May 15, 1989). Confirming the agreement reached on May 11, 1989 between EPA Region I and Central Maine Power Company.
7. Letter from William H. Laubenstein III, Central Maine Power Company to Elissa Tonkin, EPA Region I (May 23, 1989). Concerning recommendation of PRPs with attached May 23, 1989 Letter from William H. Laubenstein III, Central Maine Power Company to Elissa Tonkin, EPA Region I.
8. Letter from William H. Laubenstein III, Central Maine Power Company to Elissa Tonkin, EPA Region I (June 6, 1989). Concerning transmittal of attached May 19, 1989 Letter from James R. Wallace, Combustion Engineering to Andrew K. Towt, Central Maine Power Company.
9. Letter from Elissa Tonkin, EPA Region I to William H. Laubenstein III, Central Maine Power Company (June 6, 1989). Concerning response to May 23, 1989 letters from William H. Laubenstein III, Central Maine Power Company.
10. Letter from James R. Wallace, E.C. Jordan Co. to Andrew K. Towt, Central Maine Power Company (June 29, 1989). Concerning transmittal of the Proposed Plan prepared by E.C. Jordan for Central Maine Power Company.
11. "Proposed Plan for Remedial Action - F. O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company (June 1989).
12. Letter from William H. Laubenstein III, Central Maine Power Company to Merrill S. Hohman, EPA Region I (July 6, 1989). Concerning Central Maine Power Company's Proposed Plan.
13. Cross Reference: Letter from Thomas Benn, State of Maine Department of Environmental Protection to Andrew K. Towt, Central Maine Power Company (September 8, 1989). Concerning September 6, 1989 meeting regarding Draft Final Remedial Investigation/Feasibility Study [Filed and cited as entry number 33 in 3.1 Remedial Investigation (RI) Correspondence].
14. Cross Reference: Letter from Andrew K. Towt, Central Maine Power Company to Thomas Benn, State of Maine Department of Environmental Protection (September 18, 1989). Concerning receipt of September 6, 1989 letter from Thomas Benn and clarification of Central Maine Power Company's position [Filed and cited as entry number 34 in 3.1 Remedial Investigation (RI) Correspondence].

4.3 Scopes of Work

1. Letter from Andrew K. Towt, Central Maine Power Company to Michael Jasinski, EPA Region I and Cynthia M. Kuhns, State of Maine Department of Environmental Protection (December 23, 1988) with attached December 1988 "Request for Proposals for Bench Testing Solidification/Stabilization Technologies," prepared by E.C. Jordan Co. for Central Maine Power Company.

4.4 Interim Deliverables

Reports

1. Letter from James R. Wallace and James R. Mihelcic, E.C. Jordan Co. to Michael Jasinski, EPA Region I (February 14, 1989). Concerning transmittal of attached "Summary of the Solvent Extraction Treatability Study on Soils from the O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company. ("Task Order Memorandum A", "Appendix A: Test Plan", "Appendix B: Lab Notebook Record", and "Appendix C: PCB Chromatograms," of this report contain Confidential Business Information (CBI) and are excluded.)

Comments

2. Comments Dated March 8, 1989 from Edward R. Bates, U.S. EPA Office of Research and Development on the "Summary of the Solvent Extraction Treatability Study on Soils from the O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company.

4.6 Feasibility Study (FS) Reports

Reports

1. First "Draft Feasibility Study Report," prepared by E.C. Jordan Co. for Central Maine Power Company (June 1988).
2. First "Draft Feasibility Study Report Supplement," prepared by E.C. Jordan Co. for Central Maine Power Company (June 3, 1988).
3. Second "Draft Remedial Investigation/Feasibility Study - Volume III: Technical Report - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988).
4. Second "Draft Remedial Investigation/Feasibility Study - Volume IV: Appendices - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988).
5. "Draft Final - Remedial Investigation/Feasibility Study - Volume III - Technical Report - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (June 1989).
6. "Draft Final - Remedial Investigation/Feasibility Study - Volume IV - Appendices - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (June 1989).
7. Cross Reference: Errata Sheet for the June 1989 O'Connor Co. Site "Draft Final Remedial Investigation/Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (July 19, 1989) [Filed and cited as entry number 7 in 3.6 Remedial Investigation (RI) Reports].

4.6 Feasibility Study (FS) Reports (cont'd.)

Comments

8. Comments Dated June 27, 1988 from Steven A. Serian, EPA Region I on the June 1988 First "Draft Feasibility Study Report," prepared by E.C. Jordan Co. for Central Maine Power Company.
9. Comments Dated October 3, 1988 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the June 1988 First "Draft Feasibility Study Report," prepared by E.C. Jordan Co. for Central Maine Power Company.
10. Cross Reference: Comments Dated March 30, 1989 from Michael Jasinski, EPA Region I on the:
    - Second "Draft Remedial Investigation/Feasibility Study - Volume I: Technical Report - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume II: Appendices - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume III: Technical Report - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume IV: Appendices - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - "Summary of the Solvent Extraction Treatability Study on Soils from the O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company (February 1989)

    [Filed and cited as entry number 8 in 3.6 Remedial Investigation (RI) Reports].
11. Cross Reference: Comments Dated April 10, 1989 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the:
    - Second "Draft Remedial Investigation/Feasibility Study - Volume I: Technical Report - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume II: Appendices - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume III: Technical Report - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume IV: Appendices - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - "Summary of the Solvent Extraction Treatability Study on Soils from the O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company (February 1989)

    [Filed and cited as entry number 9 in 3.6 Remedial Investigation (RI) Reports].

4.6 Feasibility Study (FS) Reports (cont'd.)

12. Cross Reference: Comments Dated April 26, 1989 from James R. Wallace, prepared by E.C. Jordan Co. for Central Maine Power Company on the:
    - Second "Draft Remedial Investigation/Feasibility Study - Volume I: Technical Report - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume II: Appendices - Remedial Investigation," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume III: Technical Report - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - Second "Draft Remedial Investigation/Feasibility Study - Volume IV: Appendices - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988),
    - "Summary of the Solvent Extraction Treatability Study on Soils from the O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company (February 1989)

    [Filed and cited as entry number 10 in 3.6 Remedial Investigation (RI) Reports].
13. Comments Dated June 29, 1989 from Richard Christian, Camp Dresser & McKee Inc. on the June 1989 "Draft Final - Remedial Investigation/Feasibility Study - Volume IV - Appendices - Feasibility Study," prepared by E.C. Jordan Co. for Central Maine Power Company.

Responses to Comments

14. Response Dated August 5, 1988 from James R. Wallace and Patricia Ianni, E.C. Jordan Co. for Central Maine Power Company to the June 27, 1988 Comments from Steven A. Serian, EPA Region I.
15. Cross Reference: Response Dated May 9, 1989 from Michael Jasinski, EPA Region I to the April 26, 1989 Comments from James R. Wallace, E.C. Jordan Co. for Central Maine Power Company [Filed and cited as entry number 11 in 3.6 Remedial Investigation (RI) Reports].
16. Cross Reference: Response Dated June 30, 1989 from James R. Wallace, E.C. Jordan Co. for Central Maine Power Company to the March 30, 1989 Comments from Michael Jasinski, EPA Region I [Filed and cited as entry number 12 in 3.6 Remedial Investigation (RI) Reports].

Comments on the Feasibility Study (FS) Report received by EPA Region I during the formal public comment period are filed and cited in 5.3 Responsiveness Summaries.

4.7 Work Plans and Progress Reports

Reports

1. Letter from Denise Reynolds for James R. Wallace and Jeffrey Brandow, E.C. Jordan Co. to Andrew K. Towt, Central Maine Power Company (October 31, 1988). Concerning transmittal of attached:
    A. "Laboratory-Scale Treatability Testing of the Solvent Extraction Process for the F. O'Connor Site - Workplan (Draft)," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1, 1988). (Appendix B of this document contains Confidential Business Information (CBI) material and is excluded.)
    B. "Request for Proposals for Bench Testing Solvent Extraction Technologies," prepared by E.C. Jordan Co. for Central Maine Power Company (November 1988).

4.7 Work Plans and Progress Reports (cont'd.)

Comments

2. Comments Dated November 14, 1988 from Michael Jasinski, EPA Region I on the November 1, 1988 "Laboratory-Scale Treatability Testing of the Solvent Extraction Process for the F. O'Connor Site - Workplan (Draft)," prepared by E.C. Jordan Co. for Central Maine Power Company.
3. Comments Dated November 14, 1988 from Cynthia M. Kuhns, State of Maine Department of Environmental Protection on the November 1, 1988 "Laboratory-Scale Treatability Testing of the Solvent Extraction Process for the F. O'Connor Site - Workplan (Draft)," prepared by E.C. Jordan Co. for Central Maine Power Company.

4.9 Proposed Plans for Selected Remedial Action

1. "EPA Proposes Cleanup Plan for the O'Connor Superfund Site," EPA Region I (July 1989).

Comments on the Proposed Plan received by EPA Region I during the formal public comment period are filed and cited in 5.3 Responsiveness Summaries.

5.0 Record of Decision (ROD)

5.1 Correspondence

1. Memorandum from Jonathan Z. Cannon, EPA Headquarters to Regional Administrators, Regions I-X (May 25, 1989) with attached list of NPL sites delegated to Regional Administrators.
2. Letter from William H. Laubenstein III, Central Maine Power Company to Elissa Tonkin, EPA Region I (June 6, 1989) with attached May 19, 1989 Letter Report from James R. Wallace, Combustion Engineering to Andrew K. Towt, Central Maine Power Company.
3. Memorandum from Edward R. Bates, U.S. EPA Office of Research and Development to Michael Jasinski, EPA Region I (September 8, 1989). Concerning selection of remedial alternative for the O'Connor site.
4. Memorandum from Elissa Tonkin, EPA Region I to Michael Jasinski, EPA Region I (September 25, 1989). Concerning review and response to September 8, 1989 Letter from Edward R. Bates.
5. Letter from Dean C. Marriott, State of Maine Department of Environmental Protection to Paul G. Keough, EPA Region I (September 26, 1989). Concerning State of Maine Department of Environmental Protection's review and concurrence with selection of the remedy at the O'Connor site.

5.3 Responsiveness Summaries

1. Cross Reference: Responsivness Summary is Appendix A of the Record of Decision [Filed and cited as entry number 1 in 5.4 Record of Decision (ROD)].

The following citations indicate written comments received by EPA Region I during the formal public comment period.

2. Comments Dated August 17, 1989 from William H. Bostard, Harmon Environmental Services, Inc. on the July 1989 "EPA Proposes Cleanup Plan for the O'Connor Superfund Site," EPA Region I.
3. Comments Dated August 18, 1989 from William H. Laubenstein III, Central Maine Power Company on the July 1989 "EPA Proposes Cleanup Plan for the O'Connor Superfund Site," EPA Region I.
4. Comments Dated August 18, 1989 from Dean C. Marriott, State of Maine Department of Environmental Protection on the July 1989 "EPA Proposes Cleanup Plan for the O'Connor Superfund Site," EPA Region I.

5.4 Record of Decision (ROD)

1. Record of Decision, EPA Region I (September 27, 1989).

9.0 State Coordination

9.1 Correspondence

1. Letter from Marilyn Wade, EPA Region I to State of Maine Executive Department (December 24, 1984). Concerning proposed site activities and the intergovernmental review process.
2. Letter from Harold Kimball, State of Maine Executive Department to Marilyn Wade, EPA Region I (March 22, 1985). Concerning intergovernmental review.
3. Letter from Thomas Benn, State of Maine Department of Environmental Protection to Michael Jasinski, EPA Region I (August 30, 1989). Concerning target clean-up levels for PCBs and cPAHs with attached:
    - A. Memorandum from Robert Frakes, State of Maine Department of Human Services to Cynthia M. Kuhns, State of Maine Department of Environmental Protection (December 5, 1988). Concerning proposed target clean-up levels for PCBs and cPAHs.
    - B. Memorandum from Kenneth Carr, U.S. Department of the Interior Fish and Wildlife Service to Steven A. Serian, EPA Region I (September 6, 1988). Concerning soil target levels for PCBs. (A section of this memorandum has been redacted.)

10.0 Enforcement

10.7 EPA Administrative Orders

1. Executive Summary of the O'Connor Co. Site with attached Unilateral Administrative Order, *In the Matter of The F. O' Connor Company*, Docket No. I-85-1031 (December 21, 1984).
2. Administrative Order by Consent, *In the Matter of The F. O'Connor Site*, F. O'Connor Company and Central Maine Power Company, Docket No. I-86-1031 (May 13, 1986).
3. Amended Administrative Order by Consent, *In the Matter of The F. O'Connor Site*, F. O'Connor Company and Central Maine Power Company, Docket No. I-86-1031 (March 23, 1987).

11.0 Potentially Responsible Party (PRP)

11.9 PRP-Specific Correspondence

1. Letter from Merrill S. Hohman, EPA Region I to Clifford H. Goodall, Dyer Goodall and Zeegers (Attorney for F. O'Connor Company) (April 18, 1985). Concerning notification of potential liability.
2 Letter from Merrill S. Hohman, EPA Region I to Mathew Hunter, Central Maine Power Company (April 22, 1985). Concerning notification of potential liability.
3. Letter from Cynthia M. Kuhns, State of Maine Department of Environmental Protection to Andrew K. Towt, Central Maine Power Company (November 3, 1987). Concerning Tour II Data Package with attached:
   A. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (November 17, 1986). Concerning approval for Central Maine Power Company to send wastes to specified facilities.
   B. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (November 26, 1986). Concerning solid waste area and extension of security fence.
4. Letter from William H. Laubenstein III, Central Maine Power Company to Steven A. Serian, EPA Region I and Cynthia M. Kuhns, State of Maine Department of Environmental Protection (October 11, 1988). Concerning action in response to respondents' request for a waiver of time requirements.
5. Letter from Elissa Tonkin, EPA Region I to William H. Laubenstein III, Central Maine Power Company (October 11, 1988). Concerning confirmation that EPA Region I and Central Maine Power Company have agreed to extend the dispute resolution period.
6. Letter from William H. Laubenstein III, Central Maine Power Company to Michael Jasinski, EPA Region I and Cynthia M. Kuhns, State of Maine Department of Environmental Protection (October 13, 1988). Concerning the extension of time to resolve the dispute surrounding the Pilot Study/Feasibility Study.
7. Letter from William H. Laubenstein III, Central Maine Power Company to Michael Jasinski, EPA Region I and Cynthia M. Kuhns, State of Maine Department of Environmental Protection (October 13, 1988). Concerning the schedule for the Pilot Study/Feasibility Study.
8. Cross Reference: Letter from James R. Wallace, E.C. Jordan Co. to Andrew K. Towt, Central Maine Power Company (June 29, 1989). Concerning transmittal of the Proposed Plan prepared by E.C. Jordan for Central Maine Power Company [Filed and cited as entry number 10 in 4.1 Correspondence].
9. Cross Reference: "Proposed Plan for Remedial Action - F. O'Connor Site," prepared by E.C. Jordan Co. for Central Maine Power Company (June 1989). [Filed and cited as entry number 11 in 4.1 Correspondence].

13.0 Community Relations

13.1 Correspondence

1. "Requests to EPA from the Maine People's Alliance," Maine People's Alliance (May 8, 1985).
2. Letter from Merrill S. Hohman, EPA Region I to Cathy Hinds, Maine People's Alliance (June 28, 1985). Concerning response to questions asked in May 8, 1985 "Requests to EPA from the Maine People's Alliance."
3. Letter from Patty D'Andrea, EPA Region I to Henry D. Aho, State of Maine Department of Environmental Protection (August 6, 1985). Concerning transmittal of Draft Community Relations Plan.
4. Letter from Andrew K. Towt, Central Maine Power Company to Marilyn Wade, EPA Region I (November 18, 1985). Concerning public notification of all activity at the site.

5. Letter from Steven A. Serian, EPA Region I to Andrew K. Towt, Central Maine Power Company (April 28, 1986). Concerning transmittal of the Draft Community Relations Plan.
6. Letter from Steven A. Serian, EPA Region I to John Edgerly, City of Augusta (January 19, 1988). Concerning Superfund site activities.
7. Letter from Steven A. Serian, EPA Region I to Daniel Fitzpatrick, City of Augusta (February 1, 1988). Concerning activities planned by EPA Region I and Maine Department of Environmental Protection.
8. Letter from Michael Jasinski, EPA Region I to Madeline Cyr, City of Augusta Clerk's Office (July 12, 1989). Concerning transmittal of four volume Remedial Investigation/Feasibility Study and the Proposed Plan.

13.2 Community Relations Plans

1. "Draft Community Relations Plan," NUS Corporation (August 1985).
2. "Community Relations Plan," NUS Corporation (September 1985).

13.3 News Clippings/Press Releases

1. "Environmental News," EPA Region I (December 27, 1984). Concerning Administrative Order requiring a plan to secure the site.
2. "Environmental News," EPA Region I (May 12, 1986). Concerning Administrative Consent Order for the Remedial Investigation.
3. "Central Maine Power News," Central Maine Power Company (May 13, 1986). Concerning agreement to conduct the Remedial Investigation and Feasibility Study.
4. "Environmental News," EPA Region I (May 13, 1986). Concerning Central Maine Power Company and EPA Region I Consent Agreement to conduct the Remedial Investigation/Feasibility Study.
5. "Environmental News - Public Meeting to Explain Plans for the F. O'Connor Superfund Site Announced," EPA Region I (June 1986).
6. "For Release," Central Maine Power Company (March 4, 1987). Concerning completion of the first phase of sampling for PCB contamination.
7. "Environmental News," EPA Region I (March 25, 1987). Concerning modified Administrative Consent Order.
8. "The United States Environmental Protection Agency Invites Public Comment on the Feasibility Study and Proposed Plan for the O'Connor Co. Site in Augusta, Maine and Announces the Availability of the Site Administrative Record," Kennebec Journal - Augusta, Maine (July 12, 1989).
9. "EPA Proposes $13.2 Million Junkyard Cleanup," Portland Press Herald - Portland Maine (July 14, 1989).
10. "EPA Officials Explain O'Connor Site Plan," Kennebec Journal - Augusta, Maine (July 20, 1989).
11. "Environmental News - Media Advisory," EPA Region I (August 8, 1989). Concerning public hearing to be held on August 10, 1989.
12. "Residents Tell CMP to 'Clean up Mess' at O'Connor Junkyard," Kennebec Journal - Augusta, Maine (August 11, 1989).
13. "Environmental News - EPA to Hold Press Conference Regarding Cleanup Plans for O'Connor Co. Superfund Site," EPA Region I (September 26, 1989).
14. "Environmental News - EPA Announces Cleanup Plans for the O'Connor Co. Superfund Site in Augusta, Maine," EPA Region I (September 28, 1989).

13.4 Public Meetings

1. "Draft Summary of the RI/FS Startup Public Meeting," EPA Region I (June 11, 1986).
2. EPA Region I Meeting Agenda, Public Informational Meeting for the O'Connor Co. Superfund Site (July 19, 1989).
3. "Alternatives Evaluated and EPA's Preferred Alternative," Public Hearing Handout for the O'Connor Co. Superfund Site (August 10, 1989).
4. Cross Reference: Transcript, Proposed Plan Public Meeting for the O'Connor Co. Site (August 10, 1989) [Filed and included as Exhibit B in entry number 1 in 5.3 Responsiveness Summaries].
5. Letter from William H. Laubenstein III, Central Maine Power Company to Michael Jasinski, EPA Region I (August 18, 1989). Concerning transmittal of attached exhibits used by Central Maine Power Company during its comments at the August 10, 1989 Public Hearing.

13.5 Fact Sheets

1. "Superfund Program: Plans for Remedial Investigation/Feasibility Study," EPA Region I (May 1986).
2. "Summary of the Record of Decision," EPA Region I (September 1989).

13.6 Mailing Lists

1. Mailing List, members of the public to receive information on the O'Connor Co. Site.

14.0 Congressional Relations

14.1 Correspondence

1. Letter from John R. McKernan Jr., Member of the U.S. House of Representatives to Michael R. Deland, EPA Region I (June 14, 1984). Concerning the request for action to minimize threat of O'Connor site.
2. Letter from Michael R. Deland, EPA Region I to John R. McKernan Jr., Member of the U.S. House of Representatives (July 13, 1984). Concerning response to June 14, 1984 letter.

16.0 Natural Resource Trustee

16.1 Correspondence

1. Letter from Gordon E. Beckett, U.S. Department of the Interior Fish and Wildlife Service to Steven A. Serian, EPA Region I (April 17, 1987). Concerning confirmation of agreement reached at April 9, 1987 and April 10, 1987 meetings.
2. Letter from Patricia L. Meaney for Merrill S. Hohman, EPA Region I to William Patterson, U.S. Department of the Interior (May 26, 1987). Concerning notification of potential damages to natural resources.
3. Letter from Patricia L. Meaney for Merrill S. Hohman, EPA Region I to Sharon Christopherson, U.S. Department of Commerce National Oceanic and Atmospheric Administration. Concerning notification of potential damages to natural resources (May 26, 1987).
4. Letter from Gordon E. Beckett, U.S. Department of the Interior Fish and Wildlife Service to Steven A. Serian, EPA Region I (July 21, 1987). Concerning receipt of Trustee Notification Form.
5. Letter from Kenneth Finkelstein, U.S. Department of Commerce National Oceanic and Atmospheric Administration to Steven A. Serian, EPA Region I. (June 28, 1988). Concerning preferred target levels in Riggs Brook.

16.1 Correspondence (cont'd.)

6. Letter from Kenneth Finkelstein, U.S. Department of Commerce National Oceanic and Atmospheric Administration to Steven A. Serian, EPA Region I (September 6, 1988). Concerning monitoring as a component to any selected remedy.
7. Memorandum from Kenneth Carr, U.S. Department of the Interior Fish and Wildlife Service to Steven A. Serian, EPA Region I (September 6, 1988). Concerning soil target levels for PCBs. (A section of this memorandum has been redacted.)
8. Letter from Kenneth Finkelstein, U.S. Department of Commerce National Oceanic and Atmospheric Administration to Michael Jasinski, EPA Region I (February 14, 1989). Concerning target levels chosen on-site and in Riggs Brook.
9. Letter from Kenneth Finkelstein, U.S. Department of Commerce National Oceanic and Atmospheric Administration to Michael Jasinski, EPA Region I (February 27, 1989). Concerning lead and aluminum levels in Riggs Brook sediment and/or surface water.
10. Letter from Gordon E. Beckett, U.S. Department of the Interior Fish and Wildlife Service to Michael Jasinski, EPA Region I (April 7, 1989). Concerning tentative clean-up levels chosen for contaminants at the O'Connor Co. site.
11. Letter from Gordon E. Beckett, U.S. Department of the Interior Fish and Wildlife Service to Paul G. Keough, EPA Region I (August 25, 1989). Concerning formulating a decision with respect to remediation of environmental impacts at the O'Connor Co. site. (A section of this letter has been redacted.)
12. Letter from Gordon E. Beckett, U.S. Department of the Interior Fish and Wildlife Service to Michael Jasinski, EPA Region I (September 6, 1989). Concerning likely environmental impacts of Central Maine Power Company's proposal to remove and treat only those soils with PCB and PAH levels in excess of 10 parts per million (ppm).

16.4 Trustee Notification Form and Selection Guide

1. " Trustee Notification Form," EPA Region I.

16.5 Technical Issue Papers

1. "A Discussion of PCB Target Levels in Aquatic Sediments," L. Jay Field, U.S. Department of Commerce National Oceanic and Atmospheric Administration and Robert N. Dexter, EVS Consultants, Inc. (January 11, 1988).

17.0 Site Management Records

17.2 Access Records

1. Letter from Henry D. Aho, State of Maine Department of Environmental Protection to William O'Connor (June 18, 1984). Concerning access to his property on June 26, 1984 and June 27, 1984 by EPA Region I.

17.3 Site Security Records

Reports

1. Letter from Clifford H. Goodall, Dyer, Goodall and Zeegers (Attorney for F. O'Connor Company) to Charles C. Bering, EPA Region I (February 6, 1985) with attached February 6, 1985 "Site Security Plan," F. O'Connor Company.

Comments

2. Comments Dated March 11, 1985 from Charles C. Bering, EPA Region I on the February 6, 1985 "Site Security Plan," F. O'Connor Company.

Responses to Comments

3. Response Dated March 18, 1985 from Clifford H. Goodall, Dyer, Goodall and Zeegers (Attorney for F. O'Connor Company) on the March 11, 1985 Comments from Charles C. Bering, EPA Region I.

17.4 Site Photographs/Maps

In addition to the maps contained in the June 1989 "Draft Final Remedial Investigation/Feasibility Study," E.C. Jordan Co. for Central Maine Power Company (See 3.6 Remedial Investigation (RI) and 4.6 Feasibility Study (FS)), the following may be reviewed, by appointment only, at EPA Region I, Boston, Massachusetts:

1. Site Contour Map of Tank Locations, Acheron Engineering Services, (May 16, 1985).
2. Map of Shallow Soils Location Plan, J.K. Richard Associates (June 4, 1985).
3. Book of Site Photographs and Slides of the O'Connor Co. Site from 1986 to 1988 containing:
   A. Initial Site Walkover (August 20, 1986).
   B. Surficial Soil Sampling.
   C. Surface Water and Sediment Sampling (October 21, 1986).
   D. Tank Removal (October 1986).
   E. Area III, Snow Fence Confirmation Area (March 1987).
   F. Flood Photos of Site (April 1987).
   G. Test Pit Subsurface Soil Sampling (July 1987).
   H. Scrap Removal and Transformer Locations (August 1987).
   I. Transformer Locations After Removal (August 1987).
   J. Transformer Locations Grab Sampling (Post Removal) (October 30, 1987).
   K. Groundwater Sampling (December 1986).
4. Contour Map showing the location of scrap and white goods at the O'Connor Co. Site, E.C. Jordan Co.
5. Site Map of the O'Connor Co. Site and Surrounding Area.
6. Contour Map of the O'Connor Co. Site and Surrounding Area, E.C. Jordan Co.

17.8 State and Local Technical Records

1. "Well Samples Taken 3/13/78."
2. Letter from Gardner S. Hunt, State of Maine Department of Environmental Protection to Richard Dinitto, Ecology and Environment, Inc. (March 31, 1981) with attached sampling and analysis data.

Section II

Guidance Documents

GUIDANCE DOCUMENTS

EPA guidance documents may be reviewed at EPA Region I, Boston, Massachusetts.

General EPA Guidance Documents

1. "National Oil and Hazardous Substances Pollution Contingency Plan," Code of Federal Regulations (Title 40, Part 300), 1985.
2. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, amended October 17, 1986.
3. "National Oil and Hazardous Substances Pollution Contingency Plan," Proposed Rule. 53 Federal Register 51394. December 21, 1988.
4. Memorandum from John W. Lyon, U.S. Environmental Protection Agency Toxic Substance Division to Sanford W. Harvey, Jr., Enforcement Division, EPA Region IV (August 3, 1979). Concerning applicability of PCB regulations to spills which occurred prior to the effective date of the 1978 regulation.
5. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Community Relations in Superfund: A Handbook (Interim Version) (EPA/HW-6, OSWER Directive 9230.0-3A), March 1986.
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